SEQUENCE LISTING

<110> MYCOTA BIOSCIENCES INC.
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      BUSSEY, Howard
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<120> IDENTIFICATION OF CANDIDA ALBICANS ESSENTIAL FUNGAL
      SPECIFIC GENES AND USE THEREOF IN ANTIFUNGAL DRUG
      DISCOVERY

<130> 10182-015-999 (originally 12875.3)

<140> 10/018,105 (national stage of PCT/CA00/00533)
<141> 2002-07-15 (371c date 2000-05-05)

<150> 60/132,878
<151> 1999-05-05

<160> 13

<170> FastSEQ for Windows Version 4.0

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Val Leu Leu Asn Phe Val Lys Ala Thr Glu Asn Asn Asn Phe Lys Leu
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gaa gtt gaa gcg tca tgg agc aat att gat ttc ctt cct agc ttt ata   2907
Glu Val Glu Ala Ser Trp Ser Asn Ile Asp Phe Leu Pro Ser Phe Ile
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gag gcc atc gtt ggc ttc aat gac tct ttg tac gaa cag aca att gaa   2955
Glu Ala Ile Val Gly Phe Asn Asp Ser Leu Tyr Glu Gln Thr Ile Glu
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aca att ttt ggt tta gga gac act gaa gtg gaa tta gaa gat gat gct   3003
Thr Ile Phe Gly Leu Gly Asp Thr Glu Val Glu Leu Glu Asp Asp Ala
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tca gat caa gaa ata tat tct acc gtg atc aac tca tta ggg tta aca   3051
Ser Asp Gln Glu Ile Tyr Ser Thr Val Ile Asn Ser Leu Gly Leu Thr
     80   85   90

gat caa gat ttg gat ttt att aat ttt gat tta acc aac aaa aaa cat   3099
Asp Gln Asp Leu Asp Phe Ile Asn Phe Asp Leu Thr Asn Lys Lys His
 95   100   105   110

aca cca aga atc gca gcc cat tac gat cac tat tct gat gtt cta act   3147
Thr Pro Arg Ile Ala Ala His Tyr Asp His Tyr Ser Asp Val Leu Thr
                115   120   125

aag ttt ggc gat cga ctc aaa agt gaa tgt gca aaa gac tct ttt ggg   3195
Lys Phe Gly Asp Arg Leu Lys Ser Glu Cys Ala Lys Asp Ser Phe Gly
            130   135   140

aat gca gtg gaa acg aaa aat ggt caa att caa acg tgg tta cta tat   3243
Asn Ala Val Glu Thr Lys Asn Gly Gln Ile Gln Thr Trp Leu Leu Tyr
            145   150   155

aac gat aag ata tat tgt tcg gct aat gat ttg ttt gca tta cga act   3291
Asn Asp Lys Ile Tyr Cys Ser Ala Asn Asp Leu Phe Ala Leu Arg Thr
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3

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175                 180                 185                 190


tca aaa gat gca cct ttg gtg att tta tat gga agc ccg act gag gaa    3387
Ser Lys Asp Ala Pro Leu Val Ile Leu Tyr Gly Ser Pro Thr Glu Glu
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ctg act aaa gat ttt ctt aaa ata ttg tat cca gat gca aag gct gga    3435
Leu Thr Lys Asp Phe Leu Lys Ile Leu Tyr Pro Asp Ala Lys Ala Gly
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aaa tta aag ttt gta tgg agg tac att cca ctg gga atc aaa aaa ctg    3483
Lys Leu Lys Phe Val Trp Arg Tyr Ile Pro Leu Gly Ile Lys Lys Leu
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gac tca att tct gga tac ggt gta tca ttg aaa atg gaa aag tat gat    3531
Asp Ser Ile Ser Gly Tyr Gly Val Ser Leu Lys Met Glu Lys Tyr Asp
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tat tct ggt gca gaa gga aat cca aag tat gat ttg agt cga gat ttc    3579
Tyr Ser Gly Ala Glu Gly Asn Pro Lys Tyr Asp Leu Ser Arg Asp Phe
255                 260                 265                 270

acc aga att aat gac tcg caa gag ttg gtc ctg gtc aat gaa aaa cat    3627
Thr Arg Ile Asn Asp Ser Gln Glu Leu Val Leu Val Asn Glu Lys His
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tcg tat gaa ctt ggt gtt aaa ttg act tca ttc ata tta tcc aat cgt    3675
Ser Tyr Glu Leu Gly Val Lys Leu Thr Ser Phe Ile Leu Ser Asn Arg
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tac aag agt act aaa tat gac ctt tta gat acg att tta acc aac ttt    3723
Tyr Lys Ser Thr Lys Tyr Asp Leu Leu Asp Thr Ile Leu Thr Asn Phe
                305                 310                 315

ccc aag ttt att cct tac att gca cga tta cca aaa tta cta aat cat    3771
Pro Lys Phe Ile Pro Tyr Ile Ala Arg Leu Pro Lys Leu Leu Asn His
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gaa aaa gtt aaa tcc aaa gtg ctt gga aat gaa gat ata ggg cta tct    3819
Glu Lys Val Lys Ser Lys Val Leu Gly Asn Glu Asp Ile Gly Leu Ser
335                 340                 345                 350

caa gac tcc tac gga ata tat atc aac ggt tcc cca ata aat cca cta    3867
Gln Asp Ser Tyr Gly Ile Tyr Ile Asn Gly Ser Pro Ile Asn Pro Leu
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gag tta gat att tac aat cta ggt acc agg ata aag gag gaa tta cag    3915
Glu Leu Asp Ile Tyr Asn Leu Gly Thr Arg Ile Lys Glu Glu Leu Gln
                370                 375                 380

act gtg aaa gat tta gtg aaa ctt gga ttt gat acc gta caa gca aag    3963
Thr Val Lys Asp Leu Val Lys Leu Gly Phe Asp Thr Val Gln Ala Lys
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ttt cga aat ggg aat aca tta atg ggt aac aat gaa aat aga ttt aaa    4059
Phe Arg Asn Gly Asn Thr Leu Met Gly Asn Asn Glu Asn Arg Phe Lys
415             420             425             430

gtg tat gaa aat gaa ttt aag aag ggt agt tca gaa aag ggt ggg gtc    4107
Val Tyr Glu Asn Glu Phe Lys Lys Gly Ser Ser Glu Lys Gly Gly Val
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Leu Phe Phe Asn Asn Ile Glu Leu Asp Asn Thr Phe Lys Glu Tyr Thr
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act gat cgt gag gag gca tat tta gga gtt ggt tct cat aaa ctt aag    4203
Thr Asp Arg Glu Glu Ala Tyr Leu Gly Val Gly Ser His Lys Leu Lys
        465             470             475

cca aat caa att ccg tta ttg aaa gag aac atc cat gat tta att ttc    4251
Pro Asn Gln Ile Pro Leu Leu Lys Glu Asn Ile His Asp Leu Ile Phe
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gca tta aat ttt ggg aac aaa aac caa ttg cgg gtg ttt ttc act tta    4299
Ala Leu Asn Phe Gly Asn Lys Asn Gln Leu Arg Val Phe Phe Thr Leu
495             500             505             510

tct aag gtg att ttg gac tcc ggt ata cct caa caa gtt gga gtt ttg    4347
Ser Lys Val Ile Leu Asp Ser Gly Ile Pro Gln Gln Val Gly Val Leu
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ccc gtt ata gga gat gac cca atg gat ctg tta ctc gct gag aaa ttt    4395
Pro Val Ile Gly Asp Asp Pro Met Asp Leu Leu Leu Ala Glu Lys Phe
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tat tgg att gct gag aaa tca agc aca caa gag gca tta gca ata ttg    4443
Tyr Trp Ile Ala Glu Lys Ser Ser Thr Gln Glu Ala Leu Ala Ile Leu
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tat aaa tat ttt gaa tca aac agt cca gat gaa gtt gat gac tta tta    4491
Tyr Lys Tyr Phe Glu Ser Asn Ser Pro Asp Glu Val Asp Asp Leu Leu
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gat aaa gtg gaa gta ccc gaa gat tat aaa gtg gat tat aat cat gtg    4539
Asp Lys Val Glu Val Pro Glu Asp Tyr Lys Val Asp Tyr Asn His Val
575             580             585             590

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Leu Asn Lys Phe Ser Ile Ser Thr Ala Ser Val Ile Phe Asn Gly Val
            595             600             605

att tac gat tta aga gca cca aac tgg cag att gca atg agt aaa caa    4635
Ile Tyr Asp Leu Arg Ala Pro Asn Trp Gln Ile Ala Met Ser Lys Gln
            610             615             620

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Ile Ser Gln Asp Ile Ser Leu Ile Lys Thr Phe Leu Arg Gln Gly Pro
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Ile Glu Gly Arg Leu Lys Asp Val Leu Tyr Ser Asn Ala Lys Ser Glu
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cgc aat tta cgt ata att cca tta gaa cct agt gac att att tac aag    4779
Arg Asn Leu Arg Ile Ile Pro Leu Glu Pro Ser Asp Ile Ile Tyr Lys
655                 660                 665                 670

aaa atc gac aag gaa tta ata aac aat tca att gca ttc aag aag cta    4827
Lys Ile Asp Lys Glu Leu Ile Asn Asn Ser Ile Ala Phe Lys Lys Leu
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gat aaa gcg cag ggt gtg tct gga aca ttt tgg cta gtg tcg gat ttt    4875
Asp Lys Ala Gln Gly Val Ser Gly Thr Phe Trp Leu Val Ser Asp Phe
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Thr Lys Ser Ala Ile Ile Thr Gln Leu Ile Asp Leu Leu Leu Leu Leu
                705                 710                 715

aaa aag aaa gca att cag ata aga att att aat act ggg gat aca gat    4971
Lys Lys Lys Ala Ile Gln Ile Arg Ile Ile Asn Thr Gly Asp Thr Asp
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gtt ttt gga aaa ttg aaa aca aag ttt aaa tta acc gcc tta aca aat    5019
Val Phe Gly Lys Leu Lys Thr Lys Phe Lys Leu Thr Ala Leu Thr Asn
735                 740                 745                 750

gga caa att gat gaa att att gag att ttg aaa aaa tcc aac gct tca    5067
Gly Gln Ile Asp Glu Ile Ile Glu Ile Leu Lys Lys Ser Asn Ala Ser
                755                 760                 765

agt gca aat aat gat gaa ttg aaa aaa atg ctt gag act aag caa tta    5115
Ser Ala Asn Asn Asp Glu Leu Lys Lys Met Leu Glu Thr Lys Gln Leu
                770                 775                 780

cct gct cat cac tct ttt ttg cta ttc aac tct aga tat ttt aga ttg    5163
Pro Ala His His Ser Phe Leu Leu Phe Asn Ser Arg Tyr Phe Arg Leu
                785                 790                 795

gat gga aat ttt gga tac gag gaa ttg gat caa att ata gag ttt gaa    5211
Asp Gly Asn Phe Gly Tyr Glu Glu Leu Asp Gln Ile Ile Glu Phe Glu
        800                 805                 810

gta tct caa aga ttg aac tta atc ccg gac atc atg gag gca tat ccg    5259
Val Ser Gln Arg Leu Asn Leu Ile Pro Asp Ile Met Glu Ala Tyr Pro
815                 820                 825                 830

gat gag ttt agg tcg aag aag gta agt gat ttt aat ctg gtt ttg tct    5307
Asp Glu Phe Arg Ser Lys Lys Val Ser Asp Phe Asn Leu Val Leu Ser
                835                 840                 845

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Phe Asp Phe Ser Ser Leu Asp Phe Ser Asn Ser Ile Asp Val Thr Thr
        880                  885                  890

tat gaa gaa aat agt cca gtt gat gta tta ata att ttg aac cct atg    5499
Tyr Glu Glu Asn Ser Pro Val Asp Val Leu Ile Ile Leu Asn Pro Met
895                  900                  905                  910

gat gaa tat tct caa aaa ttg ata agc ctt gtt aat agc att aca gat    5547
Asp Glu Tyr Ser Gln Lys Leu Ile Ser Leu Val Asn Ser Ile Thr Asp
                915                  920                  925

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Phe Leu Phe Leu Asn Ile Arg Ile Leu Leu Gln Pro Arg Val Asp Leu
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Lys Glu Glu Ile Lys Ile His Lys Phe Tyr Arg Gly Val Tyr Pro Gln
            945                  950                  955

ccg act ccc aaa ttt gat tcc aat ggc aag tgg atc caa cat tat tca    5691
Pro Thr Pro Lys Phe Asp Ser Asn Gly Lys Trp Ile Gln His Tyr Ser
        960                  965                  970

gct caa ttt gaa agt att cca tcc aat gtg acc tat tct act gaa tta    5739
Ala Gln Phe Glu Ser Ile Pro Ser Asn Val Thr Tyr Ser Thr Glu Leu
975                  980                  985                  990

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Asp Val Pro His Lys Trp Ile Val Val Pro Gln Leu Ser Ser Met Asp
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tta aac aca atc aat ttc agc gaa agc cac tct gtt gat gca aaa tac    5835
Leu Asn Thr Ile Asn Phe Ser Glu Ser His Ser Val Asp Ala Lys Tyr
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tct cta aaa aat ata tta att gaa gga tat gct aga gat att cat act    5883
Ser Leu Lys Asn Ile Leu Ile Glu Gly Tyr Ala Arg Asp Ile His Thr
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Gly Lys Ala Pro Asp Gly Leu Ile Phe Arg Ala Phe Asn Lys Asn Tyr
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tca act gat act ttg gtg atg act tcc ttg gac tat ttt caa atc aaa    5979
Ser Thr Asp Thr Leu Val Met Thr Ser Leu Asp Tyr Phe Gln Ile Lys
1055                 1060                 1065                 1070

gcg tat cct agt att ttc aac ttt agt acg acc tca aat gac aca tta    6027
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agc att gag gtg cca gtt ttt aaa att gat gga tcg acc ata tat cca    6123
Ser Ile Glu Val Pro Val Phe Lys Ile Asp Gly Ser Thr Ile Tyr Pro
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agg gta atg aaa tct ggc aac aat aag cca atg ctg acg aga aaa cat    6171
Arg Val Met Lys Ser Gly Asn Asn Lys Pro Met Leu Thr Arg Lys His
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gca gat ata aat att ttt aca att gct agt ggc caa ctt tat gaa aag    6219
Ala Asp Ile Asn Ile Phe Thr Ile Ala Ser Gly Gln Leu Tyr Glu Lys
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tta act agc att atg att gcg tca gta aga aaa cat aac cct agc ctg    6267
Leu Thr Ser Ile Met Ile Ala Ser Val Arg Lys His Asn Pro Ser Leu
            1155            1160                1165

aca ata aaa ttc tgg att ttg gaa gat ttt gtg acc cca caa ttc aaa    6315
Thr Ile Lys Phe Trp Ile Leu Glu Asp Phe Val Thr Pro Gln Phe Lys
          1170            1175                1180

cac ttg gta gag ctt atc tca ata aag tat aat gtc gaa tat gag ttt    6363
His Leu Val Glu Leu Ile Ser Ile Lys Tyr Asn Val Glu Tyr Glu Phe
        1185            1190                1195

att agt tac aaa tgg ccc aat ttc ttg aga aaa cag aaa acc aaa gaa    6411
Ile Ser Tyr Lys Trp Pro Asn Phe Leu Arg Lys Gln Lys Thr Lys Glu
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aga atg att tgg ggg tat aag att ttg ttt ttg gac gtt ttg ttc cca    6459
Arg Met Ile Trp Gly Tyr Lys Ile Leu Phe Leu Asp Val Leu Phe Pro
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Gln Asp Leu Asn Lys Ile Ile Phe Ile Asp Ala Asp Gln Ile Cys Arg
              1235            1240                1245

gca gat ttg aca gaa ttg gtt aac atg gat ctt gaa ggt gct cca tat    6555
Ala Asp Leu Thr Glu Leu Val Asn Met Asp Leu Glu Gly Ala Pro Tyr
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gga ttt act cca atg tgt gat tct cgg gaa gaa atg gaa ggt ttc aga    6603
Gly Phe Thr Pro Met Cys Asp Ser Arg Glu Glu Met Glu Gly Phe Arg
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ttt tgg aaa gaa gga tac tgg tcc gat gtt ttg aag gat gat ttg aaa    6651
Phe Trp Lys Glu Gly Tyr Trp Ser Asp Val Leu Lys Asp Asp Leu Lys
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tat cat att agt gca tta ttt gtt gtt gat ttg caa aag ttc aga tct    6699
Tyr His Ile Ser Ala Leu Phe Val Val Asp Leu Gln Lys Phe Arg Ser
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ata aaa gct gga gac aga ttg aga gca cac tat caa aag ctt tct agt    6747
Ile Lys Ala Gly Asp Arg Leu Arg Ala His Tyr Gln Lys Leu Ser Ser
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gat cca aat tcg ttg agc aat tta gat caa gat ttg ccc aat aat atg    6795
Asp Pro Asn Ser Leu Ser Asn Leu Asp Gln Asp Leu Pro Asn Asn Met
            1330                1335                1340

caa aga ctg ata aaa att ttc agt ttg cct caa aat tgg ctc tgg tgt    6843
Gln Arg Leu Ile Lys Ile Phe Ser Leu Pro Gln Asn Trp Leu Trp Cys
        1345                1350                1355

gaa acg tgg tgc tca gat aaa agc ttg gaa gat gca aaa atg att gat    6891
Glu Thr Trp Cys Ser Asp Lys Ser Leu Glu Asp Ala Lys Met Ile Asp
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ctt tgc aac aat cca tta act aga gaa aat aaa tta gat gct gct aag    6939
Leu Cys Asn Asn Pro Leu Thr Arg Glu Asn Lys Leu Asp Ala Ala Lys
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aga ttg atc cca gaa tgg att gaa tac gag caa gaa att gaa cca ttg    6987
Arg Leu Ile Pro Glu Trp Ile Glu Tyr Glu Gln Glu Ile Glu Pro Leu
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gta tca tta gta cag aat aat acc gcc aaa gaa gtt gtt caa gag ata    7035
Val Ser Leu Val Gln Asn Asn Thr Ala Lys Glu Val Val Gln Glu Ile
            1410                1415                1420

gaa att gat aca gac gga gaa caa gaa gaa caa aaa caa gaa agt aat    7083
Glu Ile Asp Thr Asp Gly Glu Gln Glu Glu Gln Lys Gln Glu Ser Asn
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gat gat gat ttt att cac gat gaa ttg taattgtcaa agtcacatgg          7130
Asp Asp Asp Phe Ile His Asp Glu Leu
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aataaatagt gagaactcct gaaacggcat taaatacgca cgttgggtag agataataca 7190

aatatagata aatagataga gagaaaaaaa tgttggattt ttttcagact tctcttcctc 7250

ctgggcgcct ccggtttaac tataattttt taagattaca caaaattcaa gtacacgcac 7310

tttctaatta ttttattgaa gagtcataat cagtaatgaa ttttttttt ttttgatttt  7370

cgattctcga tttccgattt cctcgttgat tggtataatc taaacgaaca aacaggtata 7430


aacctttgta gttagttttt tttttttctt tctttctttc ttgtacttttt tcttaattgt 7490

cttttctttt tttcactttt cttaaacttg ttatatcatt gccttaagac tattgaatca 7550

gttcagtt                                                           7558


<210> 2
<211> 1447
<212> PRT
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9

<213> Candida albicans

<400> 2

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Met Ser Phe Ala Arg Tyr Ile Tyr Tyr Thr Ile Ala Val Ala Val Leu
 1               5                  10                  15

Leu Asn Phe Val Lys Ala Thr Glu Asn Asn Asn Phe Lys Leu Glu Val
            20                  25                  30

Glu Ala Ser Trp Ser Asn Ile Asp Phe Leu Pro Ser Phe Ile Glu Ala
            35                  40                  45

Ile Val Gly Phe Asn Asp Ser Leu Tyr Glu Gln Thr Ile Glu Thr Ile
        50                  55                  60

Phe Gly Leu Gly Asp Thr Glu Val Glu Leu Glu Asp Asp Ala Ser Asp
 65                 70                  75                  80

Gln Glu Ile Tyr Ser Thr Val Ile Asn Ser Leu Gly Leu Thr Asp Gln
                85                  90                  95

Asp Leu Asp Phe Ile Asn Phe Asp Leu Thr Asn Lys Lys His Thr Pro
            100                 105                 110

Arg Ile Ala Ala His Tyr Asp His Tyr Ser Asp Val Leu Thr Lys Phe
            115                 120                 125

Gly Asp Arg Leu Lys Ser Glu Cys Ala Lys Asp Ser Phe Gly Asn Ala
        130                 135                 140

Val Glu Thr Lys Asn Gly Gln Ile Gln Thr Trp Leu Leu Tyr Asn Asp
145                 150                 155                 160

Lys Ile Tyr Cys Ser Ala Asn Asp Leu Phe Ala Leu Arg Thr Asp Leu
            165                 170                 175

Ser Ser His Ser Thr Leu Leu Phe Asp Arg Ile Ile Gly Lys Ser Lys
            180                 185                 190

Asp Ala Pro Leu Val Ile Leu Tyr Gly Ser Pro Thr Glu Glu Leu Thr
            195                 200                 205

Lys Asp Phe Leu Lys Ile Leu Tyr Pro Asp Ala Lys Ala Gly Lys Leu
            210                 215                 220

Lys Phe Val Trp Arg Tyr Ile Pro Leu Gly Ile Lys Lys Leu Asp Ser
225                 230                 235                 240

Ile Ser Gly Tyr Gly Val Ser Leu Lys Met Glu Lys Tyr Asp Tyr Ser
            245                 250                 255

Gly Ala Glu Gly Asn Pro Lys Tyr Asp Leu Ser Arg Asp Phe Thr Arg
            260                 265                 270

Ile Asn Asp Ser Gln Glu Leu Val Leu Val Asn Glu Lys His Ser Tyr
            275                 280                 285
```

10

```
Glu Leu Gly Val Lys Leu Thr Ser Phe Ile Leu Ser Asn Arg Tyr Lys
    290                 295                 300

Ser Thr Lys Tyr Asp Leu Leu Asp Thr Ile Leu Thr Asn Phe Pro Lys
305                 310                 315                 320

Phe Ile Pro Tyr Ile Ala Arg Leu Pro Lys Leu Leu Asn His Glu Lys
            325                 330                 335

Val Lys Ser Lys Val Leu Gly Asn Glu Asp Ile Gly Leu Ser Gln Asp
            340                 345                 350

Ser Tyr Gly Ile Tyr Ile Asn Gly Ser Pro Ile Asn Pro Leu Glu Leu
            355                 360                 365

Asp Ile Tyr Asn Leu Gly Thr Arg Ile Lys Glu Glu Leu Gln Thr Val
    370                 375                 380

Lys Asp Leu Val Lys Leu Gly Phe Asp Thr Val Gln Ala Lys Leu Leu
385                 390                 395                 400

Ile Ala Lys Phe Ala Leu Leu Ser Ala Val Lys Gln Thr Gln Phe Arg
            405                 410                 415

Asn Gly Asn Thr Leu Met Gly Asn Asn Glu Asn Arg Phe Lys Val Tyr
            420                 425                 430

Glu Asn Glu Phe Lys Lys Gly Ser Ser Glu Lys Gly Gly Val Leu Phe
            435                 440                 445

Phe Asn Asn Ile Glu Leu Asp Asn Thr Phe Lys Glu Tyr Thr Thr Asp
    450                 455                 460

Arg Glu Glu Ala Tyr Leu Gly Val Gly Ser His Lys Leu Lys Pro Asn
465                 470                 475                 480

Gln Ile Pro Leu Leu Lys Glu Asn Ile His Asp Leu Ile Phe Ala Leu
            485                 490                 495

Asn Phe Gly Asn Lys Asn Gln Leu Arg Val Phe Phe Thr Leu Ser Lys
            500                 505                 510

Val Ile Leu Asp Ser Gly Ile Pro Gln Gln Val Gly Val Leu Pro Val
            515                 520                 525

Ile Gly Asp Asp Pro Met Asp Leu Leu Leu Ala Glu Lys Phe Tyr Trp
    530                 535                 540

Ile Ala Glu Lys Ser Ser Thr Gln Glu Ala Leu Ala Ile Leu Tyr Lys
545                 550                 555                 560

Tyr Phe Glu Ser Asn Ser Pro Asp Glu Val Asp Asp Leu Leu Asp Lys
            565                 570                 575

Val Glu Val Pro Glu Asp Tyr Lys Val Asp Tyr Asn His Val Leu Asn
            580                 585                 590
```

11

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Lys Phe Ser Ile Ser Thr Ala Ser Val Ile Phe Asn Gly Val Ile Tyr
    595             600             605

Asp Leu Arg Ala Pro Asn Trp Gln Ile Ala Met Ser Lys Gln Ile Ser
    610             615             620

Gln Asp Ile Ser Leu Ile Lys Thr Phe Leu Arg Gln Gly Pro Ile Glu
625             630             635             640

Gly Arg Leu Lys Asp Val Leu Tyr Ser Asn Ala Lys Ser Glu Arg Asn
            645             650             655

Leu Arg Ile Ile Pro Leu Glu Pro Ser Asp Ile Ile Tyr Lys Lys Ile
            660             665             670

Asp Lys Glu Leu Ile Asn Asn Ser Ile Ala Phe Lys Lys Leu Asp Lys
    675             680             685

Ala Gln Gly Val Ser Gly Thr Phe Trp Leu Val Ser Asp Phe Thr Lys
    690             695             700

Ser Ala Ile Ile Thr Gln Leu Ile Asp Leu Leu Leu Leu Leu Lys Lys
705             710             715             720

Lys Ala Ile Gln Ile Arg Ile Ile Asn Thr Gly Asp Thr Asp Val Phe
            725             730             735

Gly Lys Leu Lys Thr Lys Phe Lys Leu Thr Ala Leu Thr Asn Gly Gln
            740             745             750

Ile Asp Glu Ile Ile Glu Ile Leu Lys Lys Ser Asn Ala Ser Ser Ala
    755             760             765

Asn Asn Asp Glu Leu Lys Lys Met Leu Glu Thr Lys Gln Leu Pro Ala
    770             775             780

His His Ser Phe Leu Leu Phe Asn Ser Arg Tyr Phe Arg Leu Asp Gly
785             790             795             800

Asn Phe Gly Tyr Glu Glu Leu Asp Gln Ile Ile Glu Phe Glu Val Ser
            805             810             815

Gln Arg Leu Asn Leu Ile Pro Asp Ile Met Glu Ala Tyr Pro Asp Glu
            820             825             830

Phe Arg Ser Lys Lys Val Ser Asp Phe Asn Leu Val Leu Ser Gly Leu
            835             840             845

Asp Asn Met Asp Trp Phe Asp Leu Val Thr Ser Ile Val Thr Lys Ser
    850             855             860

Phe His Val Asp Glu Lys Arg Phe Ile Val Asp Val Asn Arg Phe Asp
865             870             875             880

Phe Ser Ser Leu Asp Phe Ser Asn Ser Ile Asp Val Thr Thr Tyr Glu
            885             890             895
```

12

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Glu Asn Ser Pro Val Asp Val Leu Ile Ile Leu Asn Pro Met Asp Glu
          900             905              910

Tyr Ser Gln Lys Leu Ile Ser Leu Val Asn Ser Ile Thr Asp Phe Leu
          915             920              925

Phe Leu Asn Ile Arg Ile Leu Leu Gln Pro Arg Val Asp Leu Lys Glu
    930             935             940

Glu Ile Lys Ile His Lys Phe Tyr Arg Gly Val Tyr Pro Gln Pro Thr
945             950             955             960

Pro Lys Phe Asp Ser Asn Gly Lys Trp Ile Gln His Tyr Ser Ala Gln
          965             970             975

Phe Glu Ser Ile Pro Ser Asn Val Thr Tyr Ser Thr Glu Leu Asp Val
          980             985             990

Pro His Lys Trp Ile Val Val Pro Gln Leu Ser Ser Met Asp Leu Asn
          995             1000            1005

Thr Ile Asn Phe Ser Glu Ser His Ser Val Asp Ala Lys Tyr Ser Leu
    1010            1015            1020

Lys Asn Ile Leu Ile Glu Gly Tyr Ala Arg Asp Ile His Thr Gly Lys
1025            1030            1035            1040

Ala Pro Asp Gly Leu Ile Phe Arg Ala Phe Asn Lys Asn Tyr Ser Thr
          1045            1050            1055

Asp Thr Leu Val Met Thr Ser Leu Asp Tyr Phe Gln Ile Lys Ala Tyr
          1060            1065            1070

Pro Ser Ile Phe Asn Phe Ser Thr Thr Ser Asn Asp Thr Leu Leu Ser
          1075            1080            1085

Ala Ser Glu Asn Lys Tyr Gln Ala Asn Thr Glu Glu Leu Glu Ser Ile
    1090            1095            1100

Glu Val Pro Val Phe Lys Ile Asp Gly Ser Thr Ile Tyr Pro Arg Val
1105            1110            1115            1120

Met Lys Ser Gly Asn Asn Lys Pro Met Leu Thr Arg Lys His Ala Asp
          1125            1130            1135

Ile Asn Ile Phe Thr Ile Ala Ser Gly Gln Leu Tyr Glu Lys Leu Thr
    1140            1145            1150

Ser Ile Met Ile Ala Ser Val Arg Lys His Asn Pro Ser Leu Thr Ile
    1155            1160            1165

Lys Phe Trp Ile Leu Glu Asp Phe Val Thr Pro Gln Phe Lys His Leu
    1170            1175            1180

Val Glu Leu Ile Ser Ile Lys Tyr Asn Val Glu Tyr Glu Phe Ile Ser
1185            1190            1195            1200
```

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Tyr Lys Trp Pro Asn Phe Leu Arg Lys Gln Lys Thr Lys Glu Arg Met
            1205                1210                1215

Ile Trp Gly Tyr Lys Ile Leu Phe Leu Asp Val Leu Phe Pro Gln Asp
            1220                1225                1230

Leu Asn Lys Ile Ile Phe Ile Asp Ala Asp Gln Ile Cys Arg Ala Asp
         1235                1240                1245

Leu Thr Glu Leu Val Asn Met Asp Leu Glu Gly Ala Pro Tyr Gly Phe
      1250                1255                1260

Thr Pro Met Cys Asp Ser Arg Glu Glu Met Glu Gly Phe Arg Phe Trp
1265                1270                1275                1280

Lys Glu Gly Tyr Trp Ser Asp Val Leu Lys Asp Asp Leu Lys Tyr His
            1285                1290                1295

Ile Ser Ala Leu Phe Val Val Asp Leu Gln Lys Phe Arg Ser Ile Lys
         1300                1305                1310

Ala Gly Asp Arg Leu Arg Ala His Tyr Gln Lys Leu Ser Ser Asp Pro
         1315                1320                1325

Asn Ser Leu Ser Asn Leu Asp Gln Asp Leu Pro Asn Asn Met Gln Arg
      1330                1335                1340

Leu Ile Lys Ile Phe Ser Leu Pro Gln Asn Trp Leu Trp Cys Glu Thr
1345                1350                1355                1360

Trp Cys Ser Asp Lys Ser Leu Glu Asp Ala Lys Met Ile Asp Leu Cys
            1365                1370                1375

Asn Asn Pro Leu Thr Arg Glu Asn Lys Leu Asp Ala Ala Lys Arg Leu
            1380                1385                1390

Ile Pro Glu Trp Ile Glu Tyr Glu Gln Glu Ile Glu Pro Leu Val Ser
      1395                1400                1405

Leu Val Gln Asn Asn Thr Ala Lys Glu Val Val Gln Glu Ile Glu Ile
      1410                1415                1420

Asp Thr Asp Gly Glu Gln Glu Glu Gln Lys Gln Glu Ser Asn Asp Asp
1425                1430                1435                1440

Asp Phe Ile His Asp Glu Leu
            1445


<210> 3
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<212> DNA
<213> Candida albicans

<220>
<221> CDS
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14

<222> (338)..(3103)
<223> Candida albicans Alr1

<220>
<221> Misc_feature
<222> 182, 3408
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caacccaaca cccccctgtt cctagtctag tccaatttat taagtcatat attgttgatt 120

aattaaacag tcactagtcc tcagtcctca gtccttagtt cttggttctt aatattaaga 180

tnttccattt ttttttttta cccaagctat gaaaattatt tttgttgtct aacaactata 240

ataatattta ccagaaattg ctacaaatat aaataaataa ataaataaat ataattaaga 300

gtatatctcc cctttgtttt ttttttttctt cccagcc atg tcc gat agt gaa agt   355
                                           Met Ser Asp Ser Glu Ser
                                            1   5

tat tat caa aat tca act act aat caa cct att cct aga tct gat gaa   403
Tyr Tyr Gln Asn Ser Thr Thr Asn Gln Pro Ile Pro Arg Ser Asp Glu
            10   15   20

gta ttg gat gat cat aga aat caa atc act aat gat tgt gcc att agt   451
Val Leu Asp Asp His Arg Asn Gln Ile Thr Asn Asp Cys Ala Ile Ser
        25   30   35

gat agt gaa gat gag ttg gaa tta aaa tca gaa tta gaa tca gaa gtt   499
Asp Ser Glu Asp Glu Leu Glu Leu Lys Ser Glu Leu Glu Ser Glu Val
        40   45   50

gta aaa agc gaa aaa caa caa caa cat cat caa gag att aca tca gat   547
Val Lys Ser Glu Lys Gln Gln Gln His His Gln Glu Ile Thr Ser Asp
 55   60   65   70

aat gct aaa cca ttg act cgt aaa tct ggt tct tca att aag aaa aaa   595
Asn Ala Lys Pro Leu Thr Arg Lys Ser Gly Ser Ser Ile Lys Lys Lys
                75   80   85

tct aat ctt acc gat aaa gat aga att acc aac cct atg agt tta tct   643
Ser Asn Leu Thr Asp Lys Asp Arg Ile Thr Asn Pro Met Ser Leu Ser
                90   95   100

ggt ggt gat gat act att aac agc ggt cac aaa aat cgt aat tat aac   691
Gly Gly Asp Asp Thr Ile Asn Ser Gly His Lys Asn Arg Asn Tyr Asn
            105   110   115

atg agt tca tta cgt aaa gat ttt tat tta aaa gat aat act gac gac   739
Met Ser Ser Leu Arg Lys Asp Phe Tyr Leu Lys Asp Asn Thr Asp Asp
        120   125   130

aat tct act aat aat cat act cat ctt gca att cca att cca att cca   787
Asn Ser Thr Asn Asn His Thr His Leu Ala Ile Pro Ile Pro Ile Pro

15

att cca acc cca att att act aat gct aat aaa tca aga aga aaa tct   835
Ile Pro Thr Pro Ile Ile Thr Asn Ala Asn Lys Ser Arg Arg Lys Ser
                155   .   160   165

caa ttg gaa aat tta cct cca tta att aaa aag aaa aca att ggt cgt   883

Gln Leu Glu Asn Leu Pro Pro Leu Ile Lys Lys Lys Thr Ile Gly Arg
            170   .   175   180

aat aat tct aat aat ttt gaa aat gat tta gtt agt ccc atg aca aaa   931
Asn Asn Ser Asn Asn Phe Glu Asn Asp Leu Val Ser Pro Met Thr Lys
            185   190   195

atg aaa act aat gat agt gaa gat att act aat act agc acc act gct   979
Met Lys Thr Asn Asp Ser Glu Asp Ile Thr Asn Thr Ser Thr Thr Ala
    200   205   210

aat cat atg aaa ctt ggt att ggt gct aca acc ctt ggt gtt gga act   1027
Asn His Met Lys Leu Gly Ile Gly Ala Thr Thr Leu Gly Val Gly Thr
215   220   225   230

ggt act acc gcc act gcc act gcc act gct gct gct ggt aga aga cca   1075
Gly Thr Thr Ala Thr Ala Thr Ala Thr Ala Ala Ala Gly Arg Arg Pro
                235   240   245

tct cgt tca tct att gat agt gaa gct gat tct cat gca tca aga tca   1123
Ser Arg Ser Ser Ile Asp Ser Glu Ala Asp Ser His Ala Ser Arg Ser
            250   255   260

tct caa gaa act gaa gaa gat gtt tgt ttt cct atg gtt ggt gat cat   1171
Ser Gln Glu Thr Glu Glu Asp Val Cys Phe Pro Met Val Gly Asp His
            265   270   275

att aga gtt aat gga att gat ttt gat gaa att gat gaa ttt att aga   1219
Ile Arg Val Asn Gly Ile Asp Phe Asp Glu Ile Asp Glu Phe Ile Arg
    280   285   290

gaa gaa aga gaa gaa gct tat tta caa aaa caa atg att gct aaa aat   1267
Glu Glu Arg Glu Glu Ala Tyr Leu Gln Lys Gln Met Ile Ala Lys Asn
295   300   305   310

att ctg cgt att gat gaa ttt caa aat ctt tcc aaa aat aat act act   1315
Ile Leu Arg Ile Asp Glu Phe Gln Asn Leu Ser Lys Asn Asn Thr Thr
                315   320   325

agt ggt gca tct cgt cat cca tat cat cat cac agt aat aat aat aaa   1363
Ser Gly Ala Ser Arg His Pro Tyr His His His Ser Asn Asn Asn Lys
            330   335   340

aaa aat aat ggt ggt gat ggt ggt ggt tct agt atg gca gca tta aaa   1411
Lys Asn Asn Gly Gly Asp Gly Gly Gly Ser Ser Met Ala Ala Leu Lys
            345   350   355

tat act cca aaa aat att tta aag aaa aca tta tca aga ttt gaa ttt   1459
Tyr Thr Pro Lys Asn Ile Leu Lys Lys Thr Leu Ser Arg Phe Glu Phe

16

```
act cat gaa aat tct tca tct tca gaa gaa att tat gaa ttg aag act    1507
Thr His Glu Asn Ser Ser Ser Ser Glu Glu Ile Tyr Glu Leu Lys Thr
375                 380                 385                 390

aaa caa caa cca cct tac aaa tat gat gat caa tta tca tta act tca    1555
Lys Gln Gln Pro Pro Tyr Lys Tyr Asp Asp Gln Leu Ser Leu Thr Ser
                395                 400                 405

tct aca tct tct act tct gga tct gga tct ggg cag gtg aaa ttt ggt    1603
Ser Thr Ser Ser Thr Ser Gly Ser Gly Ser Gly Gln Val Lys Phe Gly
            410                 415                 420

gga gca aga att tct gat ggg att aat gga ggt tca tta cct gat aga    1651
Gly Ala Arg Ile Ser Asp Gly Ile Asn Gly Gly Ser Leu Pro Asp Arg
            425                 430                 435

ttt tca ctt ttc cat tct gaa tca gaa gaa act att cat gcc ccc gat    1699
Phe Ser Leu Phe His Ser Glu Ser Glu Glu Thr Ile His Ala Pro Asp
    440                 445                 450

att cca tca tta gta tca cca ggt caa tct gtt cga gat tta ttt aga    1747
Ile Pro Ser Leu Val Ser Pro Gly Gln Ser Val Arg Asp Leu Phe Arg
455                 460                 465                 470


aat ggt gaa gaa act tgg tgg tta gat tgt act tgt cct act gat tcg    1795
Asn Gly Glu Glu Thr Trp Trp Leu Asp Cys Thr Cys Pro Thr Asp Ser
                475                 480                 485

gaa atg aaa atg ttg gcc aaa gca ttt ggt att cat cct tta act gct    1843
Glu Met Lys Met Leu Ala Lys Ala Phe Gly Ile His Pro Leu Thr Ala
            490                 495                 500

gaa gat att cga atg caa gaa act cgt gaa aaa gtt gaa tta ttt aaa    1891
Glu Asp Ile Arg Met Gln Glu Thr Arg Glu Lys Val Glu Leu Phe Lys
            505                 510                 515

agt tat tat ttt gtt tgt ttc cat act ttt gaa gct gat aaa gaa tct    1939
Ser Tyr Tyr Phe Val Cys Phe His Thr Phe Glu Ala Asp Lys Glu Ser
    520                 525                 530

gaa gat tat tta gaa ccg ata aat gtt tat att gtt gtt ttc cat gat    1987
Glu Asp Tyr Leu Glu Pro Ile Asn Val Tyr Ile Val Val Phe His Asp
535                 540                 545                 550

ggt ata tta acg ttc cat ttt tca cca att tct cat cca gca aat gtt    2035
Gly Ile Leu Thr Phe His Phe Ser Pro Ile Ser His Pro Ala Asn Val
            555                 560                 565

aga aga aga gtt cgt caa ttg aga gat tat gtc gat gtt agt gct gat    2083
Arg Arg Arg Val Arg Gln Leu Arg Asp Tyr Val Asp Val Ser Ala Asp
            570                 575                 580

tgg tta tgt tat gcc tta atc gat gaa att acc gat ggt ttt gcc ccc    2131
Trp Leu Cys Tyr Ala Leu Ile Asp Glu Ile Thr Asp Gly Phe Ala Pro
```

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gtg att cat gga att gaa tat gaa gct gat gcc att gaa gat gcc gtt    2179
Val Ile His Gly Ile Glu Tyr Glu Ala Asp Ala Ile Glu Asp Ala Val
    600                 605                 610

ttc act gct aga gat act gat ttt agt agt atg tta caa aga att ggt    2227
Phe Thr Ala Arg Asp Thr Asp Phe Ser Ser Met Leu Gln Arg Ile Gly
615                 620                 625                 630

gaa tca aga aga aaa gtc atg act tta atg aga tta tta tca ggt aaa    2275
Glu Ser Arg Arg Lys Val Met Thr Leu Met Arg Leu Leu Ser Gly Lys
                635                 640                 645

gct gat gtc att aaa atg ttt gct aaa aga tgt caa gaa gaa gct aat    2323
Ala Asp Val Ile Lys Met Phe Ala Lys Arg Cys Gln Glu Glu Ala Asn
                650                 655                 660

tct tct tct ggt tat tat caa cgt caa tat aac tta caa caa caa caa    2371
Ser Ser Ser Gly Tyr Tyr Gln Arg Gln Tyr Asn Leu Gln Gln Gln Gln
            665                 670                 675

caa cag gcc cca cca cca cca cct aat cct att att act tca cca att    2419
Gln Gln Ala Pro Pro Pro Pro Pro Asn Pro Ile Ile Thr Ser Pro Ile
    680                 685                 690

aat tca act ttg aat ctt aat agt tta gga act tca act ggt gga gga    2467
Asn Ser Thr Leu Asn Leu Asn Ser Leu Gly Thr Ser Thr Gly Gly Gly
695                 700                 705                 710

gta gga gta gga gga att aat ttt ggt ccc aat cca act gga aat aat    2515
Val Gly Val Gly Gly Ile Asn Phe Gly Pro Asn Pro Thr Gly Asn Asn
                715                 720                 725

act aat act aat act aat act act ggt tca cct tca cca cct caa caa    2563
Thr Asn Thr Asn Thr Asn Thr Thr Gly Ser Pro Ser Pro Pro Gln Gln
                730                 735                 740

caa caa caa cat ggt atc act aac aaa tct ttc ccc atc ccc gat gca    2611
Gln Gln Gln His Gly Ile Thr Asn Lys Ser Phe Pro Ile Pro Asp Ala
            745                 750                 755

cgt cca aga gct gat att gca tta tat tta ggt gat att caa gat cat    2659
Arg Pro Arg Ala Asp Ile Ala Leu Tyr Leu Gly Asp Ile Gln Asp His
    760                 765                 770

ata atc acc atg ttt caa aat tta tta gcc tat gaa aaa att ttc agt    2707
Ile Ile Thr Met Phe Gln Asn Leu Leu Ala Tyr Glu Lys Ile Phe Ser
775                 780                 785                 790

cgt tca cat tca aat tat tta gct caa tta caa gtt gaa tca ttc aat    2755
Arg Ser His Ser Asn Tyr Leu Ala Gln Leu Gln Val Glu Ser Phe Asn
                795                 800                 805

tcc aat aat aaa atc acc gaa atg ttt tct aaa att act ttg att ggg    2803
Ser Asn Asn Lys Ile Thr Glu Met Phe Ser Lys Ile Thr Leu Ile Gly
                810                 815                 820
```

18

```
aca atg tta gtt cca tta aat tta gtc acg gga ctt ttt ggt atg aat    2851
Thr Met Leu Val Pro Leu Asn Leu Val Thr Gly Leu Phe Gly Met Asn
        825                 830                 835

gta aga gtc cct ggt gaa ggt ggt acc aat tta ggt tgg ttt ttc gga    2899
Val Arg Val Pro Gly Glu Gly Gly Thr Asn Leu Gly Trp Phe Phe Gly
    840                 845                 850

att gtt gga gta tta ata ttt ata att att gga tca ttt ata ttt gct    2947
Ile Val Gly Val Leu Ile Phe Ile Ile Ile Gly Ser Phe Ile Phe Ala
855                 860                 865                 870

caa tgg tgg ttg aaa aaa ttg aat aat tca att gaa gga caa aat aat    2995
Gln Trp Trp Leu Lys Lys Leu Asn Asn Ser Ile Glu Gly Gln Asn Asn
                875                 880                 885

ggt aat cga cca att ttt aat cat tca tca aga aga tca att aga agt    3043
Gly Asn Arg Pro Ile Phe Asn His Ser Ser Arg Arg Ser Ile Arg Ser
            890                 895                 900

tta ggt tta aaa aaa cat ggt ggt aat aaa tca att att agt ttc ccc    3091
Leu Gly Leu Lys Lys His Gly Gly Asn Lys Ser Ile Ile Ser Phe Pro
        905                 910                 915

aat aaa tat gaa taagaataat caaagaaatg ccacagagtt tgatggtttg         3143
Asn Lys Tyr Glu
    920

tttttttttt tttattgtc atgatggagt tgtatataca tatacttttt atagaagtaa 3203

caatagtaaa tgataatagt agtcatcaat catcatattt ataattgtat ataatcgtat 3263

actaacttct tcttgattta gggaaagagt tatattattt actataaaca tttatttta  3323

cgagttgtgt taaattggag agtcaaatta ataggatgta aaagaagttt ttaaagaagg 3383

aataaagaaa tattataatt cagangttca tacagaaggg gggggaagga gaaggggata 3443

tatatcggca tttgttggta cttttgtttt tgaaataaaa tataagttta tctaaattat 3503

tatcaattat tatcaatatt gc                                          3525


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<212> PRT
<213> Candida albicans

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Met Ser Asp Ser Glu Ser Tyr Tyr Gln Asn Ser Thr Thr Asn Gln Pro
  1               5                  10                  15

Ile Pro Arg Ser Asp Glu Val Leu Asp Asp His Arg Asn Gln Ile Thr
              20                  25                  30

Asn Asp Cys Ala Ile Ser Asp Ser Glu Asp Glu Leu Glu Leu Lys Ser
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19

```
                35                        40                        45
Glu Leu Glu Ser Glu Val Val Lys Ser Glu Lys Gln Gln Gln His His
    50                    55                60

Gln Glu Ile Thr Ser Asp Asn Ala Lys Pro Leu Thr Arg Lys Ser Gly
65                    70                75                    80

Ser Ser Ile Lys Lys Lys Ser Asn Leu Thr Asp Lys Asp Arg Ile Thr
                85                    90                    95

Asn Pro Met Ser Leu Ser Gly Gly Asp Asp Thr Ile Asn Ser Gly His
            100               105               110

Lys Asn Arg Asn Tyr Asn Met Ser Ser Leu Arg Lys Asp Phe Tyr Leu
        115               120               125

Lys Asp Asn Thr Asp Asp Asn Ser Thr Asn Asn His Thr His Leu Ala
    130               135               140

Ile Pro Ile Pro Ile Pro Ile Pro Thr Pro Ile Ile Thr Asn Ala Asn
145                   150               155                   160

Lys Ser Arg Arg Lys Ser Gln Leu Glu Asn Leu Pro Pro Leu Ile Lys
            165               170               175

Lys Lys Thr Ile Gly Arg Asn Asn Ser Asn Asn Phe Glu Asn Asp Leu
            180               185               190

Val Ser Pro Met Thr Lys Met Lys Thr Asn Asp Ser Glu Asp Ile Thr
        195               200               205

Asn Thr Ser Thr Thr Ala Asn His Met Lys Leu Gly Ile Gly Ala Thr
    210               215               220

Thr Leu Gly Val Gly Thr Gly Thr Thr Ala Thr Ala Thr Ala Thr Ala
225                   230               235                   240

Ala Ala Gly Arg Arg Pro Ser Arg Ser Ser Ile Asp Ser Glu Ala Asp
            245               250               255

Ser His Ala Ser Arg Ser Ser Gln Glu Thr Glu Glu Asp Val Cys Phe
        260               265               270

Pro Met Val Gly Asp His Ile Arg Val Asn Gly Ile Asp Phe Asp Glu
        275               280               285

Ile Asp Glu Phe Ile Arg Glu Glu Arg Glu Glu Ala Tyr Leu Gln Lys
    290               295               300

Gln Met Ile Ala Lys Asn Ile Leu Arg Ile Asp Glu Phe Gln Asn Leu
305               310               315               320

Ser Lys Asn Asn Thr Thr Ser Gly Ala Ser Arg His Pro Tyr His His
            325               330               335

His Ser Asn Asn Asn Lys Lys Asn Asn Gly Gly Asp Gly Gly Gly Ser
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20

Ser Met Ala Ala Leu Lys Tyr Thr Pro Lys Asn Ile Leu Lys Lys Thr
        355   360   365

Leu Ser Arg Phe Glu Phe Thr His Glu Asn Ser Ser Ser Ser Glu Glu
    370   375   380

Ile Tyr Glu Leu Lys Thr Lys Gln Gln Pro Pro Tyr Lys Tyr Asp Asp
385   390   395   400

Gln Leu Ser Leu Thr Ser Ser Thr Ser Ser Thr Ser Gly Ser Gly Ser
            405   410   415

Gly Gln Val Lys Phe Gly Gly Ala Arg Ile Ser Asp Gly Ile Asn Gly
            420   425   430

Gly Ser Leu Pro Asp Arg Phe Ser Leu Phe His Ser Glu Ser Glu Glu
        435   440   445

Thr Ile His Ala Pro Asp Ile Pro Ser Leu Val Ser Pro Gly Gln Ser
    450   455   ⸴   460

Val Arg Asp Leu Phe Arg Asn Gly Glu Glu Thr Trp Trp Leu Asp Cys
465   470   475   480

Thr Cys Pro Thr Asp Ser Glu Met Lys Met Leu Ala Lys Ala Phe Gly
            485   490   495

Ile His Pro Leu Thr Ala Glu Asp Ile Arg Met Gln Glu Thr Arg Glu
            500   ·505   510

Lys Val Glu Leu Phe Lys Ser Tyr Tyr Phe Val Cys Phe His Thr Phe
            515   520   525

Glu Ala Asp Lys Glu Ser Glu Asp Tyr Leu Glu Pro Ile Asn Val Tyr
    530   535   540

Ile Val Val Phe His Asp Gly Ile Leu Thr Phe His Phe Ser Pro Ile
545   550   555   560

Ser His Pro Ala Asn Val Arg Arg Arg Val Arg Gln Leu Arg Asp Tyr
                565   570   575

Val Asp Val Ser Ala Asp Trp Leu Cys Tyr Ala Leu Ile Asp Glu Ile
            580   585   590

Thr Asp Gly Phe Ala Pro Val Ile His Gly Ile Glu Tyr Glu Ala Asp
        595   ·   600   605

Ala Ile Glu Asp Ala Val Phe Thr Ala Arg Asp Thr Asp Phe Ser Ser
    610   615   620

Met Leu Gln Arg Ile Gly Glu Ser Arg Arg Lys Val Met Thr Leu Met
625   630   635   640

Arg Leu Leu Ser Gly Lys Ala Asp Val Ile Lys Met Phe Ala Lys Arg

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                  645                     650                     655

Cys Gln Glu Glu Ala Asn Ser Ser Ser Gly Tyr Tyr Gln Arg Gln Tyr
            660                 665                 670

Asn Leu Gln Gln Gln Gln Gln Ala Pro Pro Pro Pro Asn Pro
            675                 680                 685

Ile Ile Thr Ser Pro Ile Asn Ser Thr Leu Asn Leu Asn Ser Leu Gly
    690                 695                 700

Thr Ser Thr Gly Gly Gly Val Gly Val Gly Gly Ile Asn Phe Gly Pro
705                 710                 715                 720

Asn Pro Thr Gly Asn Asn Thr Asn Thr Asn Thr Asn Thr Thr Gly Ser
                725                 730                 735

Pro Ser Pro Pro Gln Gln Gln Gln Gln His Gly Ile Thr Asn Lys Ser
            740                 745                 750

Phe Pro Ile Pro Asp Ala Arg Pro Arg Ala Asp Ile Ala Leu Tyr Leu
        755             760                 765

Gly Asp Ile Gln Asp His Ile Ile Thr Met Phe Gln Asn Leu Leu Ala
    770                 775                 780

Tyr Glu Lys Ile Phe Ser Arg Ser His Ser Asn Tyr Leu Ala Gln Leu
785                 790                 795                 800

Gln Val Glu Ser Phe Asn Ser Asn Asn Lys Ile Thr Glu Met Phe Ser
                805                 810                 815

Lys Ile Thr Leu Ile Gly Thr Met Leu Val Pro Leu Asn Leu Val Thr
            820                 825                 830

Gly Leu Phe Gly Met Asn Val Arg Val Pro Gly Glu Gly Gly Thr Asn
            835                 840                 845

Leu Gly Trp Phe Phe Gly Ile Val Gly Val Leu Ile Phe Ile Ile Ile
    850                 855                 860

Gly Ser Phe Ile Phe Ala Gln Trp Trp Leu Lys Lys Leu Asn Asn Ser
865                 870                 875                 880

Ile Glu Gly Gln Asn Asn Gly Asn Arg Pro Ile Phe Asn His Ser Ser
                885                 890                 895

Arg Arg Ser Ile Arg Ser Leu Gly Leu Lys Lys His Gly Gly Asn Lys
            900                 905                 910

Ser Ile Ile Ser Phe Pro Asn Lys Tyr Glu
        915                 920


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22

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gaagtgactc ntgaacttca aaaacaagtt gttgagaata ttttccaatt gataccccat 180

ggcaacccag aaggaatttc tcaagctgaa tggttgaaat tttatgaaaa tggtggcaga 240

ttacctgatt tgggatatgg gccaggtcac catttaggat ttgaggaaga atatgaagaa 300

catcattgga gaaaatacca tgctaatgat gatcctgatg tcaaaataaa acataaagaa 360

gatatcgaac atgagttgtt acatcatcaa caagagattg aagagactca cgatagatcg 420

agtcgattga aaaaatttgc tggtgattac tggtcagaga tcaatatcga caatcttaaa 480

ccaaaatata gaaaacaaca gaaatagtga gaggttagta aagagaaacc ttaaaaacaa 540

ccaggaagcc aacncttagc ttggctatat agaagtagaa atagaaatca agatcaataa 600

aaagacgcac caacagcgct actactacta ctacattttg aaaacaattt gctgggaagt 660

tgaatgattt gcacatgtga gccacatagc ttaggtatag gttgcttgaa ctaaacaccg 720

aagttcttgt attaaagata gaattcctct ctctctcaaa aagctgtcaa attgacacac 780

cagtagaagt atttttgacg ggtatattgg caagtcaaat tgaatgtgtg tcatttcaat 840

cctacaaaaa gatacaaaaa tgaataaacg aattaatata atagttgtca tcatcgtcaa 900

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cttttgtttt agagtaattt aaatgtaaaa tgtataatgt ataatgtaaa atgttttgaa 1140

attgattttc aattaatttt tcgtgtaaca aaagaagaat gaaaaaaaat ttcattatgg 1200

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tgagttttac tagtttgcca cctggtttgc cacttagttt tgccaccaag aagttggact 1320
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23

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aaagtttata tctgtctctt atataattta ccttatagtc aacttcactt ccttctttca 1380

ttccttgtag tctttgttac attttttgtt ctggttcctg ttactaacaa caacacaata 1440

tttttttttt ttaattccct cactcaattc aactcacaaa ccctatttct tttcttcttc 1500

tacttcttgg tgtaacttaa accttttttgc tggcctcttt cttttgctat tttctaaaat 1560

tcaattttgt tagctcattt taattatttc aattcaattg ttttccattt atttccatct 1620

ttcgttttcc atttatttta ttttcttctt tttagttagc tctaattcaa cttcttctac 1680

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gctaaaaaaa aatagagaca gaaaagaaa aagttaacga acaccaaaga caggaagaaa 1800

aaaaaaattc caacaacagg aacaaacatc aacaaacatt aacatcagca acaagcagaa 1860

gaccaatata cattaaccaa tcacactgaa cttactcata aactacttgc tcatatcttc 1920

ctcttttttt tttttgctg catattgaag aaatagaaac caaatagaac cactcattat 1980

atcttaatat caacaaatcc aaaacc atg gaa cat cca cca gca gct ctc aga 2033
                              Met Glu His Pro Pro Ala Ala Leu Arg
                               1                   5


aca ttt tca acc caa tca act tca tct ttg aat tca gta agt act gtt    2081
Thr Phe Ser Thr Gln Ser Thr Ser Ser Leu Asn Ser Val Ser Thr Val
 10                  15                  20                  25

tcg tct tca aga att gtt tct ctg ggc cca gtc aat ata aac aat ttc    2129
Ser Ser Ser Arg Ile Val Ser Leu Gly Pro Val Asn Ile Asn Asn Phe
                 30                  35                  40

aat aaa cca agt act ccc aaa gac cat tta ttc tat cga tgt gaa tca    2177
Asn Lys Pro Ser Thr Pro Lys Asp His Leu Phe Tyr Arg Cys Glu Ser
                 45                  50                  55

cta aaa cga aaa cta caa aaa atc cct ggc atg gaa cca ttt ttg aac    2225
Leu Lys Arg Lys Leu Gln Lys Ile Pro Gly Met Glu Pro Phe Leu Asn
                 60                  65                  70

caa gct ttc aat cag gct gaa caa ctc agt gaa caa caa gca ttg gct    2273
Gln Ala Phe Asn Gln Ala Glu Gln Leu Ser Glu Gln Gln Ala Leu Ala
    75                  80                  85

ttg gca cag gaa aga agc aat gga aat gga cat agt aat ggc aaa cgt    2321
Leu Ala Gln Glu Arg Ser Asn Gly Asn Gly His Ser Asn Gly Lys Arg
 90                  95                  100                 105

cat caa tca tta gac ggt gcc atg aat aga ctt tca gtt ggt tct gat    2369
His Gln Ser Leu Asp Gly Ala Met Asn Arg Leu Ser Val Gly Ser Asp
                110                 115                 120
```

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agt agt tcg att caa ggt tca ttg aca cga atg gct acc aat gcg tca    2417
Ser Ser Ser Ile Gln Gly Ser Leu Thr Arg Met Ala Thr Asn Ala Ser
            125                 130                 135

acg tca tct tta atc agt ggt atg cca aac agc aac act tta ttt acg    2465
Thr Ser Ser Leu Ile Ser Gly Met Pro Asn Ser Asn Thr Leu Phe Thr
            140                 145                 150

ttt act gca ggg gtt tta cca gct aat att agt gtc gat cct gct acc    2513
Phe Thr Ala Gly Val Leu Pro Ala Asn Ile Ser Val Asp Pro Ala Thr
            155                 160                 165

cat ctt tgg aaa ttg ttc caa caa ggg gcc ccc ttt tgt gtt ctt atc    2561
His Leu Trp Lys Leu Phe Gln Gln Gly Ala Pro Phe Cys Val Leu Ile
170                 175                 180                 185

aat cat atc ctt cct gat tcc caa ata cca gtt gtc agt tct gat gac    2609
Asn His Ile Leu Pro Asp Ser Gln Ile Pro Val Val Ser Ser Asp Asp
                190                 195                 200

ttg aga att tgc aaa aaa tca gta tat gac ttt tta att gcc gtc aag    2657
Leu Arg Ile Cys Lys Lys Ser Val Tyr Asp Phe Leu Ile Ala Val Lys
            205                 210                 215

acg caa ttg aat ttt gat gac gag aat atg ttc act ata tcc aat gtt    2705
Thr Gln Leu Asn Phe Asp Asp Glu Asn Met Phe Thr Ile Ser Asn Val
            220                 225                 230

ttc tcc gac aat gcc caa gat tta atc aag att att gat gtc att aat    2753
Phe Ser Asp Asn Ala Gln Asp Leu Ile Lys Ile Ile Asp Val Ile Asn
            235                 240                 245

aaa cta ctt gct gag tac tca gat gct agt gac ctg ggt ggt ggc gat    2801
Lys Leu Leu Ala Glu Tyr Ser Asp Ala Ser Asp Leu Gly Gly Gly Asp
250                 255                 260                 265

gaa gat gta aat atg gat gtt caa att acc gat gaa aga tca aaa gtt    2849
Glu Asp Val Asn Met Asp Val Gln Ile Thr Asp Glu Arg Ser Lys Val
                270                 275                 280

ttc cga gaa att atc gaa aca gaa aga aaa tat gtt caa gac ttg gaa    2897
Phe Arg Glu Ile Ile Glu Thr Glu Arg Lys Tyr Val Gln Asp Leu Glu
            285                 290                 295

cta atg tgt aaa tac cgt caa gat cta att gaa gcc gaa aat ttg tct    2945
Leu Met Cys Lys Tyr Arg Gln Asp Leu Ile Glu Ala Glu Asn Leu Ser
            300                 305                 310

tca gaa caa att cac ttg tta ttc cca aat tta aat gag att att gat    2993
Ser Glu Gln Ile His Leu Leu Phe Pro Asn Leu Asn Glu Ile Ile Asp
            315                 320                 325

ttt caa aga cga ttc ctc aat ggg tta gaa tgt aac atc aat gta cct    3041
Phe Gln Arg Arg Phe Leu Asn Gly Leu Glu Cys Asn Ile Asn Val Pro
330                 335                 340                 345

att aga tat caa aga att gga tca gta ttt att cat gct tct ttg ggc    3089
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25

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Ile Arg Tyr Gln Arg Ile Gly Ser Val Phe Ile His Ala Ser Leu Gly
                350                 355                 360

cct ttc aat gct tat gaa cct tgg act ata gga caa ttg acg gcg att    3137
Pro Phe Asn Ala Tyr Glu Pro Trp Thr Ile Gly Gln Leu Thr Ala Ile
                365                 370                 375

gat ttg atc aac aaa gaa gct gct aat ttg aaa aaa tca tcg agt cta    3185
Asp Leu Ile Asn Lys Glu Ala Ala Asn Leu Lys Lys Ser Ser Ser Leu
                380                 385                 390

ctt gat cct ggg ttt gaa ctt caa tcg tat ata tta aag ccg atc caa    3233
Leu Asp Pro Gly Phe Glu Leu Gln Ser Tyr Ile Leu Lys Pro Ile Gln
                395                 400                 405

aga ttg tgt aaa tac cca ctt ttg ttg aaa gag tta atc aaa aca tca    3281
Arg Leu Cys Lys Tyr Pro Leu Leu Leu Lys Glu Leu Ile Lys Thr Ser
410                 415                 420                 425

cca gaa tat tca aaa cag gac ccc cat ggc agc tcg tca ttg aca tca    3329
Pro Glu Tyr Ser Lys Gln Asp Pro His Gly Ser Ser Ser Leu Thr Ser
                430                 435                 440

ttc aat gaa tta ttg gtg gct aaa act gca atg aaa gaa ttg gca aat    3377
Phe Asn Glu Leu Leu Val Ala Lys Thr Ala Met Lys Glu Leu Ala Asn
                445                 450                 455

caa gtc aat gag gcg caa aga cga gca gaa aat atc gaa cat ttg gaa    3425
Gln Val Asn Glu Ala Gln Arg Arg Ala Glu Asn Ile Glu His Leu Glu
                460                 465                 470

aaa cta aaa gaa aga gta ggt aat tgg cgt ggg ttt aat ttg gat gct    3473
Lys Leu Lys Glu Arg Val Gly Asn Trp Arg Gly Phe Asn Leu Asp Ala
                475                 480                 485

caa gga gaa cta tta ttc cac gga caa gtt ggg gtt aaa gat gct gaa    3521
Gln Gly Glu Leu Leu Phe His Gly Gln Val Gly Val Lys Asp Ala Glu
490                 495                 500                 505

aat gaa aag gaa tac gtt gct tat ctt ttt gaa aaa att gta ttt ttt    3569
Asn Glu Lys Glu Tyr Val Ala Tyr Leu Phe Glu Lys Ile Val Phe Phe
                510                 515                 520

ttc aca gaa att gat gat aac aaa aaa tct gat aaa cag gaa aag aag    3617
Phe Thr Glu Ile Asp Asp Asn Lys Lys Ser Asp Lys Gln Glu Lys Lys
                525                 530                 535

agc aag ttt tcg aca aga aag aga tca act tca tca aat ctt agt tca    3665
Ser Lys Phe Ser Thr Arg Lys Arg Ser Thr Ser Ser Asn Leu Ser Ser
                540                 545                 550

tcg act act aat ttg ttg gaa tca ata aac aat tcc cga aag gat aac    3713
Ser Thr Thr Asn Leu Leu Glu Ser Ile Asn Asn Ser Arg Lys Asp Asn
                555                 560                 565

aca ttg cca ttg gaa tta aaa gga aga gtt tat ata tcg gag att tat    3761
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26

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Thr Leu Pro Leu Glu Leu Lys Gly Arg Val Tyr Ile Ser Glu Ile Tyr
570             575             580                     585

aac att tcc gct cca aac act cct ggc tca acc cta atc atc tca tgg    3809
Asn Ile Ser Ala Pro Asn Thr Pro Gly Ser Thr Leu Ile Ile Ser Trp
                590             595                     600

tca ggt aga aag gaa agc ggc tca ttc act ttg aga tat cgt agt gaa    3857
Ser Gly Arg Lys Glu Ser Gly Ser Phe Thr Leu Arg Tyr Arg Ser Glu
                605             610                     615

gaa gcc aga aac caa tgg gaa aag tgt tta cgt gat ttg aag act aat    3905
Glu Ala Arg Asn Gln Trp Glu Lys Cys Leu Arg Asp Leu Lys Thr Asn
                620             625                     630

gaa atg aat aaa caa att cat aag aag tta cgt gat tcc gac ctg tca    3953
Glu Met Asn Lys Gln Ile His Lys Lys Leu Arg Asp Ser Asp Leu Ser
        635             640             645

ttt aat act gat gac tct gcc ata tat gat tac acg ggt att agt acg    4001
Phe Asn Thr Asp Asp Ser Ala Ile Tyr Asp Tyr Thr Gly Ile Ser Thr
650             655             660                     665

tca cca gtc aat caa tca act caa caa caa tac tat gat cat cgg ggc    4049
Ser Pro Val Asn Gln Ser Thr Gln Gln Gln Tyr Tyr Asp His Arg Gly
                670             675             680

tct cac agt tcc cgc cat cac tca tcg tca tcc act ttg agt atg atg    4097
Ser His Ser Ser Arg His His Ser Ser Ser Ser Thr Leu Ser Met Met
                685             690             695

aag aat aat aga gtt aaa tct ggt gat ttg agt aga ata tct tca act    4145
Lys Asn Asn Arg Val Lys Ser Gly Asp Leu Ser Arg Ile Ser Ser Thr
                700             705             710

tca aca aca tta gat tct ttc agt aac aac ttg aat ggg tca cca aat    4193
Ser Thr Thr Leu Asp Ser Phe Ser Asn Asn Leu Asn Gly Ser Pro Asn
        715             720             725

acc act aat cca tct ttg acg tct tca gat gcc acc aaa aca att cca    4241
Thr Thr Asn Pro Ser Leu Thr Ser Ser Asp Ala Thr Lys Thr Ile Pro
730             735             740                     745

aca ttt gac gtt gca att aaa ttg ctt tac aaa tcg aca gaa ttg tca    4289
Thr Phe Asp Val Ala Ile Lys Leu Leu Tyr Lys Ser Thr Glu Leu Ser
                750             755                     760

gag cca ttg att gtc aat gca caa att gag tat aat gac ctt tta cag    4337
Glu Pro Leu Ile Val Asn Ala Gln Ile Glu Tyr Asn Asp Leu Leu Gln
                765             770                     775

aaa att atc tcc cag att atc act tcg aac ttg gtg gct gat gat gtc    4385
Lys Ile Ile Ser Gln Ile Ile Thr Ser Asn Leu Val Ala Asp Asp Val
                780             785             790

aat att agt cga ttg aga tat aaa gac gac gaa gga gac ttt gtg aat    4433
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27

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Asn Ile Ser Arg Leu Arg Tyr Lys Asp Asp Glu Gly Asp Phe Val Asn
   795                 800                 805

ttg aat tca gat gat gat tgg ggg tta gtg ctt gat atg tta acc agt    4481
Leu Asn Ser Asp Asp Asp Trp Gly Leu Val Leu Asp Met Leu Thr Ser
810                 815                 820                 825

gaa gac ttt tac caa aca tca agc aat gaa aaa cga ctg gtg aca gtg    4529
Glu Asp Phe Tyr Gln Thr Ser Ser Asn Glu Lys Arg Leu Val Thr Val
                830                 835                 840

tgg gtt tct tgatttaact acaggaacaa acgctacctt tgtttggtgt           4578
Trp Val Ser

gtgtgtgtat gtatgggtgc tttttttttt tatttcttga tggtgtgtga ctttggaaga 4638

taaacaaatt aagagttaat gttttgctgt gcaaataag ctgttataga tgggttcaat  4698

taatcaattt catatagata tataaatgac actttgacga aatatactat ttataaattt 4758

ccttttttct ttgttttgta agattaatgt tggttcttgt tgatgtgtcg gtacaccaaa 4818

cgcaataatt aaaatctagt aagacggtaa atgggtagat gagaaaggt caatagagtt  4878

tattctaatg tgggtgcaaa ttaaaggcaa cagataaatt tggtaaacat tttctaaaac 4938

gtattgccgc ttccagagtc aaaaaaaaga ataaagctaa tatattagtg ctaataatag 4998

tagtaataca aaacaaggtt tcaaagtttt cgctcaaaac atcaagccat tgcttatata 5058

ggatgaacta ttcaattaac aggcaaaaaa aagccatcat ttgaaaagac tctcatatca 5118

aagaggtaac ttctaatagt aatcacttgt tgtttttgat tattaaatga tttgattcta 5178

ttggttgaac taaccccaaw tgggtttktt gtttgccggg ttgaraatga atgccataaa 5238

tnattcaatt tgaaaaaaaa aaaaaatnct aatacaacac acccaacccct ttgcntttat 5298

ca                                                                5300


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<213> Candida albicans

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Ser Ser Leu Asn Ser Val Ser Thr Val Ser Ser Ser Arg Ile Val Ser
               20                 25                  30

Leu Gly Pro Val Asn Ile Asn Asn Phe Asn Lys Pro Ser Thr Pro Lys
           35                 40                  45

Asp His Leu Phe Tyr Arg Cys Glu Ser Leu Lys Arg Lys Leu Gln Lys
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28

Ile Pro Gly Met Glu Pro Phe Leu Asn Gln Ala Phe Asn Gln Ala Glu
 65   70   75   80

Gln Leu Ser Glu Gln Gln Ala Leu Ala Leu Ala Gln Glu Arg Ser Asn
                     85   90   95

Gly Asn Gly His Ser Asn Gly Lys Arg His Gln Ser Leu Asp Gly Ala
                100   105   110

Met Asn Arg Leu Ser Val Gly Ser Asp Ser Ser Ser Ile Gln Gly Ser
                115   120   125

Leu Thr Arg Met Ala Thr Asn Ala Ser Thr Ser Ser Leu Ile Ser Gly
                130   135   140

Met Pro Asn Ser Asn Thr Leu Phe Thr Phe Thr Ala Gly Val Leu Pro
145   150   155   160

Ala Asn Ile Ser Val Asp Pro Ala Thr His Leu Trp Lys Leu Phe Gln
                165   170   175

Gln Gly Ala Pro Phe Cys Val Leu Ile Asn His Ile Leu Pro Asp Ser
                180   185   190

Gln Ile Pro Val Val Ser Ser Asp Asp Leu Arg Ile Cys Lys Lys Ser
                195   200   205

Val Tyr Asp Phe Leu Ile Ala Val Lys Thr Gln Leu Asn Phe Asp Asp
     210   215   220

Glu Asn Met Phe Thr Ile Ser Asn Val Phe Ser Asp Asn Ala Gln Asp
225   230   235   240

Leu Ile Lys Ile Ile Asp Val Ile Asn Lys Leu Leu Ala Glu Tyr Ser
                245   250   255

Asp Ala Ser Asp Leu Gly Gly Gly Asp Glu Asp Val Asn Met Asp Val
                260   265   270

Gln Ile Thr Asp Glu Arg Ser Lys Val Phe Arg Glu Ile Ile Glu Thr
                275   280   285

Glu Arg Lys Tyr Val Gln Asp Leu Glu Leu Met Cys Lys Tyr Arg Gln
     290   295   300

Asp Leu Ile Glu Ala Glu Asn Leu Ser Ser Glu Gln Ile His Leu Leu
305   310   315   320

Phe Pro Asn Leu Asn Glu Ile Ile Asp Phe Gln Arg Arg Phe Leu Asn
                325   330   335

Gly Leu Glu Cys Asn Ile Asn Val Pro Ile Arg Tyr Gln Arg Ile Gly
                340   345   350

Ser Val Phe Ile His Ala Ser Leu Gly Pro Phe Asn Ala Tyr Glu Pro

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                    355                      360                      365

Trp Thr Ile Gly Gln Leu Thr Ala Ile Asp Leu Ile Asn Lys Glu Ala
    370                 375             380

Ala Asn Leu Lys Lys Ser Ser Ser Leu Leu Asp Pro Gly Phe Glu Leu
385                 390             395                         400

Gln Ser Tyr Ile Leu Lys Pro Ile Gln Arg Leu Cys Lys Tyr Pro Leu
                405             410                 415

Leu Leu Lys Glu Leu Ile Lys Thr Ser Pro Glu Tyr Ser Lys Gln Asp
            420             425                 430

Pro His Gly Ser Ser Ser Leu Thr Ser Phe Asn Glu Leu Leu Val Ala
            435             440                 445

Lys Thr Ala Met Lys Glu Leu Ala Asn Gln Val Asn Glu Ala Gln Arg
    450             455                 460

Arg Ala Glu Asn Ile Glu His Leu Glu Lys Leu Lys Glu Arg Val Gly
465                 470                 475                     480

Asn Trp Arg Gly Phe Asn Leu Asp Ala Gln Gly Glu Leu Leu Phe His
            485                 490                 495

Gly Gln Val Gly Val Lys Asp Ala Glu Asn Glu Lys Glu Tyr Val Ala
            500             505                 510

Tyr Leu Phe Glu Lys Ile Val Phe Phe Phe Thr Glu Ile Asp Asp Asn
            515             520                 525

Lys Lys Ser Asp Lys Gln Glu Lys Lys Ser Lys Phe Ser Thr Arg Lys
    530             535                 540

Arg Ser Thr Ser Ser Asn Leu Ser Ser Ser Thr Thr Asn Leu Leu Glu
545                 550                 555                     560

Ser Ile Asn Asn Ser Arg Lys Asp Asn Thr Leu Pro Leu Glu Leu Lys
                565                 570                 575

Gly Arg Val Tyr Ile Ser Glu Ile Tyr Asn Ile Ser Ala Pro Asn Thr
            580             585                 590

Pro Gly Ser Thr Leu Ile Ile Ser Trp Ser Gly Arg Lys Glu Ser Gly
            595             600                 605

Ser Phe Thr Leu Arg Tyr Arg Ser Glu Glu Ala Arg Asn Gln Trp Glu
    610             615                 620

Lys Cys Leu Arg Asp Leu Lys Thr Asn Glu Met Asn Lys Gln Ile His
625             630                 635                         640

Lys Lys Leu Arg Asp Ser Asp Leu Ser Phe Asn Thr Asp Asp Ser Ala
            645                 650                 655

Ile Tyr Asp Tyr Thr Gly Ile Ser Thr Ser Pro Val Asn Gln Ser Thr
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30

Gln Gln Gln Tyr Tyr Asp His Arg Gly Ser His Ser Ser Arg His His
            675   680   685

Ser Ser Ser Ser Thr Leu Ser Met Met Lys Asn Asn Arg Val Lys Ser
        690   695   700

Gly Asp Leu Ser Arg Ile Ser Ser Thr Ser Thr Thr Leu Asp Ser Phe
705   710   715   720

Ser Asn Asn Leu Asn Gly Ser Pro Asn Thr Thr Asn Pro Ser Leu Thr
                725   730   735

Ser Ser Asp Ala Thr Lys Thr Ile Pro Thr Phe Asp Val Ala Ile Lys
                740   745   750

Leu Leu Tyr Lys Ser Thr Glu Leu Ser Glu Pro Leu Ile Val Asn Ala
        755   760   765

Gln Ile Glu Tyr Asn Asp Leu Leu Gln Lys Ile Ile Ser Gln Ile Ile
        770   775   780

Thr Ser Asn Leu Val Ala Asp Asp Val Asn Ile Ser Arg Leu Arg Tyr
785   790   795   800

Lys Asp Asp Glu Gly Asp Phe Val Asn Leu Asn Ser Asp Asp Asp Trp
                805   810   815

Gly Leu Val Leu Asp Met Leu Thr Ser Glu Asp Phe Tyr Gln Thr Ser
                820   825   830

Ser Asn Glu Lys Arg Leu Val Thr Val Trp Val Ser
            835   840

<210> 7
<211> 1365
<212> PRT
<213> S. cerevisiae

<220>
<223> S. cerevisiae KRE5

<400> 7
Met Arg Leu Leu Ala Leu Val Leu Leu Leu Leu Cys Ala Pro Leu Arg
 1   5   10   15
Ala Trp Thr Tyr Ser Leu Arg Tyr Gly Ile Pro Glu Ser Ala Gln Val
            20   25   30
Trp Ser Ile Leu Val His Leu Leu Gly Asp Val Asp Asn Gln Leu Leu
        35   40   45
Thr Asn Leu Tyr Pro Leu Val Thr Gly Leu Asp Asp Glu Ile Asp Ile
    50   55   60
Gln Glu Asn Leu Val Ala Leu Thr Ser Asn Val Leu Arg Glu Arg Tyr
65   70   75   80
Asp Lys Glu Asp Val Ala Asp Leu Leu Glu Leu Tyr Ala Ser Leu Tyr
                85   90   95

31

```
Pro Met Gly Met Ile Gln His Asp Ile Ser Ser Asn Ala Glu Gln Asp
        100                 105                 110
Asp Ala Asn Ser Ser Tyr Phe Val Leu Asn Gly Asn Arg Tyr Glu Lys
        115                 120                 125
Pro Asp Asp Val Phe Tyr Leu Lys Ser Lys Asp Leu Thr Ile Gln Gln
    130                 135                 140
Lys Val Pro Asp Val Asp Val Ile Gln Pro Tyr Asp Val Val Ile Gly
145                 150                 155                 160
Thr Asn Ser Glu Ala Pro Ile Leu Ile Leu Tyr Gly Cys Pro Thr Val
                165                 170                 175
Ile Asp Ser Asp Phe Glu Glu Phe Asn Arg Asn Leu Phe Met Glu Ala
                180                 185                 190
Met Asn Gly Glu Gly Lys Phe Arg Phe Ile Trp Arg Ser Thr Cys Ser
        195                 200                 205
Leu Asp Gly Lys Ser Val Glu Tyr Pro Leu Thr His Pro Leu Glu Ile
    210                 215                 220
Thr Leu Gln Asn Gly Ser Arg Met Ser Ser Ile Pro Gln Leu Lys Lys
225                 230                 235                 240
Ile Leu Tyr Thr Val Pro Lys Glu Ile Leu Val Gly Ala Asp Asn Asp
                245                 250                 255
Asp Gln Leu His Asp Leu Glu Pro Glu Glu Leu Arg Glu Leu Asp Leu
        260                 265                 270
Arg Val Thr Ser Leu Ile Ser Glu Phe Tyr Gln Tyr Lys Lys Asp Ile

        275                 280                 285
Thr Ala Thr Leu Asn Phe Thr Lys Ser Ile Val Asn Asn Phe Pro Leu
    290                 295                 300
Ile Ser Lys Gln Leu Ile Lys Val Ser Ser Val Asn Lys Asp Ile Ile
305                 310                 315                 320
Thr Ser Asn Glu Glu Leu Asn Ser Lys Gly Phe Asp Tyr Asn Met Leu
                325                 330                 335
Gly Leu Tyr Ile Asn Gly Gln Asn Trp Lys Ile Thr Ser Leu Thr Pro
                340                 345                 350
Tyr Asn Leu Leu Thr Ala Leu Lys Thr Glu Tyr Gln Ser Leu Leu Lys
        355                 360                 365
Ile Thr Asn Leu Leu Gln Glu Leu Glu Pro Ser Lys Cys Ile Leu Asp
    370                 375                 380
Ser Lys Phe Leu Leu Asn Lys Phe Ser Gln Phe Ser Leu Gly Lys Leu
385                 390                 395                 400
Gln Asn Leu Gln Pro Ile Lys Met Asp Leu His Thr Ile Pro Gly Phe
                405                 410                 415
Ser Glu Ser Val Ile Tyr Phe Asn Asp Ile Glu Ser Asp Pro Gln Tyr
                420                 425                 430
Asp Glu Leu Val Asn Ser Val Gln Ala Phe Phe Asp Lys Ser Lys Phe
        435                 440                 445
Gly Glu Leu Pro Glu Ile Lys Gln Asn Trp Ser Glu Ile Ile Phe Val
        450                 455                 460
Ile Asp Phe Ala Arg Leu Glu Asp Ser Glu Val Lys Glu Ala Leu Gly
465                 470                 475                 480
Gly Leu Val Arg Ala Val Asn Val Val Ser Gln Gly Tyr Pro Gln Arg
                485                 490                 495
Val Gly Leu Leu Pro Phe Ser Ser Asp Ser Asp Lys Ser Val Val Asn
                500                 505                 510
Lys Ile Tyr Glu Leu Lys Asn Ser Thr Asp Asn Leu Thr Glu Leu Lys
        515                 520                 525
Ser Phe Leu Glu Thr Met Leu Leu Ala Asp Gly Leu Ser Ala Asn Ala
    530                 535                 540
```

32

```
Lys His Ser Lys His Ile Pro Val Pro Asp Val Phe His Leu Leu Asp
545                     550                     555                     560
Glu Leu Gln Ile Asp Glu Thr Ser Ile Ile Ile Asn Gly Glu Ile Tyr
                565                     570                     575
Pro Phe Arg Lys Asn Trp Asn Tyr Leu Ile Ala Lys Val Ile Lys Lys
                580                     585                     590
Asp Thr Glu Phe Ile Arg Lys Glu Leu Ser Asn Ser Ser Pro Lys Asn
                595                     600                     605
Lys Gln Ile Ser Val Arg Asp Leu Leu His Tyr Lys Ser Ala Asn Leu
    610                     615                     620
Arg His Asn Lys Tyr Thr Pro Asn Tyr Phe Ala Asp Ser Val Tyr Ser
625                     630                     635                     640
Ser Val Asn Asn Thr Ala Leu Glu Ser Val Cys Ser Glu Arg Ile Gly
                645                     650                     655
Tyr Tyr Thr Lys Asn Glu Glu Tyr Asn Leu Leu His Thr Ile Thr Leu
                660                     665                     670
Val Asp Asp Phe Gly Ser Ile His Ala Leu Lys Arg Leu Arg Asn Leu
                675                     680                     685
Leu His Thr Ser Phe Val Gly Val Arg Ile Arg Ile Ile His Val Gly
    690                     695                     700
Asp Ile Ser Asp Ile Trp Tyr Gln Leu Arg Gly Ser Leu Ser Gln Lys
705                     710                     715                     720
Asp Pro Ile Gly Ser Ile Asn Thr Phe Ile Asp Ala Leu Lys Leu Lys
                725                     730                     735
Lys Val Lys Ser His Thr Tyr Lys Lys Ser Gly Leu Asn Gln Leu Gly
                740                     745                     750
Leu His Lys Trp Leu Pro Asp Ile Pro Leu Phe Glu Leu Gln Lys Gly
                755                     760                     765
Ser Phe Ile Ala Leu Asn Gly Arg Phe Ile Ile Leu Ile Lys Met Lys
    770                     775                     780
Cys Gln Lys Gln Asn Ile Ser Lys Ala Lys Ile Ile Lys Arg Glu Ala
785                     790                     795                     800
Leu Arg Thr Ile Asp Ser Val Phe Ala Leu Asp Leu Leu Phe Pro Gly
                805                     810                     815
Phe Ser Gln Glu Ile Ile Asn Pro Asp Leu Ile Glu Met Ile Ser Ser
                820                     825                     830
Ile Leu Thr Arg Leu Phe Tyr Gln Gly Thr His Ile Tyr Asn Asn Gly
                835                     840                     845
Ile Asp Tyr Thr Thr Glu Ser Ser Leu Pro Arg Met Asp Leu Ser Glu
    850                     855                     860
Phe Phe Arg Pro Asn Asn Leu Thr Met Phe Glu Asp Gly Lys Ser Ala
865                     870                     875                     880
Ser Ile Asp Leu Leu Leu Ile Leu Asp Pro Leu Glu Glu Arg Thr Gln
                885                     890                     895
Met Ile Leu Ser Leu Val Glu Gln Phe Arg Pro Leu Lys Phe Val Asn
                900                     905                     910
Ile Gln Val Ile Leu Met Pro Thr Leu Glu Leu Asn Ile Val Pro Ile
    915                     920                     925
Arg Arg Ile Tyr Val Asp Asp Ala Asp Ile Val Lys Ser Ile Thr Ser
    930                     935                     940
Glu Lys Ser Arg Ser Asp Pro Glu Val Asp Ile Glu Met Asp Val Pro
945                     950                     955                     960
Asn Ser Phe Ile Val Asp Asn Asn Tyr Arg Ile Lys Lys Leu Leu Ile
                965                     970                     975
Glu Leu His Ser Phe Ser Ser Lys Thr Val Leu Ser Thr Gly Asn Ile
                980                     985                     990
Asp Gly Met Gly Gly Val Cys Leu Ala Leu Val Asp Ser Ala Gly Asn
```

33

```
            995                  1000                  1005
Ile Ile Asp Lys Thr Thr Ile Met Lys Thr Phe Gly Tyr Gly Gln Phe
      1010                  1015                  1020
His Thr Asp Lys Phe Leu Lys Gly Cys Tyr Ile Lys Ser Cys Asp Ser
1025                  1030                  1035                  1040
Arg Tyr Thr Val Gln Ser Phe Ser Thr Asp Gly His Pro Asp Phe Ile
                  1045                  1050                  1055
Pro Ser Asp Ser Leu Asp Ile Leu Ser Tyr Asn Pro Gln Lys Ile Ala
            1060                  1065                  1070
Val Lys Ile Ser Glu Glu Pro Thr His Glu Glu Glu Tyr Glu Glu Gly
         1075                  1080                  1085
Arg Asn Asn Asp Thr Ile Ile Asn Ile Phe Thr Ile Leu Glu Ser Gly
      1090                  1095                  1100
Pro Asp Glu Glu Glu Arg Tyr Met Gln Met Ile Leu Ser Ile Leu Ser
1105                  1110                  1115                  1120
Lys Cys Pro Glu Thr Gln Lys Val Asn Phe Phe Ile Leu Asp Gln Pro
                  1125                  1130                  1135
Phe Ile Ser Asp Thr Leu Arg Lys Ser Cys Glu Tyr Ile Asn Ser Ser
            1140                  1145                  1150
Asp Glu Met Arg Gly Asn Val Ile Phe Leu Asn Tyr Glu Trp Pro Gln
         1155                  1160                  1165
Trp Leu Arg Pro Gln Arg Phe Ser Ser Arg Arg Arg Asp Val Ser Arg
      1170                  1175                  1180
Phe Leu Phe Leu Asp Val Leu Leu Pro Gln Asn Ile Ser Lys Val Leu
1185                  1190                  1195                  1200
Tyr Met Ser Pro Thr Glu Val Pro Leu Asp Pro Phe Asp Ile Phe Gln
                  1205                  1210                  1215
Phe Gln Gly Leu Lys Arg Ala Pro Leu Gly Leu Phe Arg Met Ser Gly
            1220                  1225                  1230
Asp Gly Tyr Trp Lys Glu Gly Tyr Trp Glu Lys Met Leu Arg Glu Asn
         1235                  1240                  1245
Asn Leu Glu Phe Tyr Ser Thr Glu Pro Ala Phe Leu Val Asn Leu Glu
      1250                  1255                  1260
Arg Phe Arg Glu Leu Asp Ala Gly Asp Lys Tyr Arg Ile His Tyr Gln
1265                  1270                  1275                  1280
Arg Ile Ser Thr Asp Ala Met Ser Leu Val Asn Ile Gly Gln Asp Leu
                  1285                  1290                  1295
Val Asn Asn Leu Gln Leu Glu Val Pro Ile Arg Phe Leu Lys Gly Ser
            1300                  1305                  1310
Tyr Lys Lys Lys Leu Val Ile Asn Asp Glu Cys Val Ser Glu Trp Lys
         1315                  1320                  1325
Lys Lys Ile Asn Lys Phe Ala Ser Ser Pro Gly Asp Glu Asp Val Pro
      1330                  1335                  1340
Gly Glu Ser Val Ser Ser Lys Tyr Gln Asp Ser Asp Asn Ala Ala Pro
1345                  1350                  1355                  1360
Leu His Asp Glu Leu
            1365


<210> 8
<211> 1548
<212> PRT
<213> Drosophila melanogaster

<220>
<223> Drosophila melanogaster UGGT1
```

<400> 8

```
Met Leu Arg Ala Val Ala Leu Cys Val Ser Val Val Leu Ile Ala Leu
 1               5                   10                  15
Tyr Thr Pro Thr Ser Gly Glu Ser Ser Gln Ser Tyr Pro Ile Thr Thr
                20                  25                  30
Leu Ile Asn Ala Lys Trp Thr Gln Thr Pro Leu Tyr Leu Glu Ile Ala
            35                  40                  45
Glu Tyr Leu Ala Asp Glu Gln Ala Gly Leu Phe Trp Asp Tyr Val Ser
    50                  55                  60
Gly Val Thr Lys Leu Asp Thr Val Leu Asn Glu Tyr Asp Thr Glu Ser
65                  70                  75                  80
Gln Gln Tyr Asn Ala Ala Leu Glu Leu Val Lys Ser His Val Ser Ser
                85                  90                  95
Pro Gln Leu Pro Leu Leu Arg Leu Val Val Ser Met His Ser Leu Thr
                100                 105                 110
Pro Arg Ile Gln Thr His Phe Gln Leu Ala Glu Glu Leu Arg Ser Ser
            115                 120                 125
Gly Ser Cys Gln Ser Phe Thr Phe Ala Gln Val Gly Ser Glu Leu Ala
    130                 135                 140
Cys Ser Phe Asn Glu Leu Gln Lys Lys Leu Glu Val Pro Leu Ala Lys
145                 150                 155                 160
Asp Ser Leu Asp Ala Pro Val Val Thr Tyr Ser Phe Asp His Ile Phe
                165                 170                 175
Pro Gly Ser Glu Asn Asn Thr Arg Thr Val Val Leu Tyr Gly Asp Leu
            180                 185                 190
Gly Ser Ser Gln Phe Arg Thr Tyr His Lys Leu Leu Glu Lys Glu Ala
    195                 200                 205
Asn Ala Gly Arg Ile Arg Tyr Ile Leu Arg His Gln Leu Ala Lys Lys
    210                 215                 220
Asp Lys Arg Pro Val Arg Leu Ser Gly Tyr Gly Val Glu Leu His Leu
225                 230                 235                 240
Lys Ser Thr Glu Tyr Lys Ser Gln Asp Asp Ala Pro Lys Pro Glu Ala
                245                 250                 255
Gly Ser Thr Ser Asp Glu Asp Leu Ala Asn Glu Ser Asp Val Gln Gly
            260                 265                 270
Phe Asp Phe Lys Val Leu Lys Gln Lys His Pro Thr Leu Lys Arg Ala
    275                 280                 285
Leu Asp Gln Leu Arg Gln Arg Leu Leu Gln Gly Asn Asp Glu Ile Ala
    290                 295                 300
Gln Leu Lys Ala Trp Glu Phe Gln Asp Leu Gly Leu Gln Ala Ala Ala
305                 310                 315                 320
Ala Ile Ala Glu Ile Gln Gly Asp Glu Thr Leu Gln Ile Leu Gln Tyr
                325                 330                 335
Thr Ala His Asn Phe Pro Met Leu Ala Arg Thr Leu Leu Ala His Lys
            340                 345                 350
Val Thr Asp Gly Leu Arg Ala Glu Val Lys His Asn Thr Glu Ala Phe
            355                 360                 365
Gly Arg Ser Leu Asn Val Ala Pro Pro Asp Gly Ala Leu Phe Ile Asn
    370                 375                 380
Gly Leu Phe Phe Asp Ala Asp Thr Met Asp Leu Tyr Ser Leu Ile Glu
385                 390                 395                 400
Thr Leu Arg Ser Glu Met Arg Val Leu Glu Ser Leu His Ser Asn Asn
            405                 410                 415
Val Arg Gly Ser Leu Ala Ser Ser Leu Leu Ala Leu Asp Leu Thr Ala
            420                 425                 430
Ser Ser Lys Lys Glu Phe Ala Ile Asp Ile Arg Asp Thr Ala Val Gln
            435                 440                 445
```

35

Trp Val Asn Asp Ile Glu Asn Asp Val Gln Tyr Arg Arg Trp Pro Ser
    450   455   460
Ser Val Met Asp Leu Leu Arg Pro Thr Phe Pro Gly Met Leu Arg Asn
465   470   475   480
Ile Arg Lys Asn Val Phe Asn Leu Val Leu Val Val Asp Ala Leu Gln
            485   490   495
Pro Thr Ala Arg Ser Val Ile Lys Leu Ser Glu Ser Phe Val Ile His
            500   505   510
Gln Ala Pro Ile Arg Leu Gly Leu Val Phe Asp Ala Arg Asp Ala Asn
        515   520   525
Glu Asp Asn Leu Ala Asp Tyr Val Ala Ile Thr Cys Ala Tyr Asn Tyr
        530   535   540
Val Ser Gln Lys Lys Asp Ala Arg Ala Ala Leu Ser Phe Leu Thr Asp
545   550   555   560
Ile Tyr Ala Ala Val Gly Glu Thr Lys Val Val Thr Lys Lys Asp Ile
            565   570   575
Val Lys Gln Leu Thr Lys Glu Phe Thr Ser Leu Ser Phe Ala Lys Ala
        580   585   590
Glu Glu Phe Leu Glu Glu Asp Ser Thr Tyr Asp Tyr Gly Arg Glu Leu
        595   600   605
Ala Ala Glu Phe Ile Gln Arg Leu Gly Phe Gly Asp Lys Glu Gln Pro
    610   615   ,620
Gln Ala Leu Leu Asn Gly Val Pro Met Pro Ser Asn Val Val Thr Ala
625   630   635   640
Asp Ser Asp Phe Glu Glu Ala Ile Phe Thr Glu Ile Met Thr His Thr
            645   650   655
Ser Asn Leu Gln Lys Ala Val Tyr Lys Gly Glu Leu Thr Asp Asn Asp
        660   665   670
Val Ala Ile Asp Tyr Leu Met Asn Gln Pro His Val Met Pro Arg Leu
        675   680   685
Asn Gln Arg Ile Leu Ser Gln Glu Asp Val Lys Tyr Leu Asp Ile Asn
    690   695   700
Gly Val Ala Tyr Lys Asn Leu Gly Asn Val Gly Val Leu Asn Arg Leu
705   710   715   720
Ser Asn Arg Asp Met Thr Ala Thr Leu Met Asp Asn Leu Lys Tyr Phe
            725   730   735
Gly Gly Lys Lys Ser Thr Glu Leu Ile Gly Arg Thr Ser Leu Gln Phe
            740   745   750
Leu Thr Ile Trp Val Phe Ala Asp Leu Glu Thr Asp Gln Gly Arg Asp
            755   760   765
Leu Leu Thr His Ala Leu Asp Tyr Val Gln Ser Gly Glu Ser Val Arg
    770   775   780
Val Ala Phe Ile Pro Asn Thr Glu Ser Ser Ser Ala Ser Ser Arg Arg
785   790   795   800
Asn Leu Asn Arg Leu Val Trp Ala Ala Met Gln Ser Leu Pro Pro Thr
            805   810   815
Gln Ala Thr Glu Gln Val Leu Lys Trp Leu Lys Lys Pro Lys Glu Lys
        820   825   830
Ile Glu Ile Pro Thr Gln Leu Glu Asp Ile Leu Gly Ser Thr Glu Leu
        835   840   845
His Leu Lys Met Leu Arg Val Tyr Ser Gln Arg Val Leu Gly Leu Asn
    850   855   860
Lys Ser Gln Arg Leu Val Ile Gly Asn Gly Arg Leu Tyr Gly Pro Leu
865   870   875   880
Ser Ser Asp Glu Ser Phe Asp Ser Ala Asp Phe Ala Leu Leu Ala Arg
            885   890   895
Phe Ser Ser Leu Gln Tyr Ser Asp Lys Val Arg Gln Val Leu Lys Glu

36

```
              900                 905                 910
Ser Ala Gln Asp Val Asn Glu Glu Phe Asn Ser Asp Thr Leu Leu Lys
         915                 920                 925
Leu Tyr Ala Ser Leu Leu Pro Arg Gln Thr Lys Thr Arg Phe Lys Leu
         930                 935                 940
Pro Thr Asp Leu Lys Thr Asp His Ser Val Val Lys Leu Pro Pro Lys
945                 950                 955                 960
Gln Glu Lys Leu Pro His Phe Asp Val Ala Ala Val Leu Asp Pro Ala
              965                 970                 975
Ser Arg Ala Ala Gln Lys Leu Thr Pro Ile Leu Ile Leu Leu Arg Gln
              980                 985                 990
Val Leu Asn Cys Gln Leu Asn Leu Tyr Leu Ile Pro Val Pro Gln His
              995                1000                1005
Ser Asp Met Pro Val Lys Asn Phe Tyr Arg Tyr Val Val Glu Pro Glu
         1010                1015                1020
Val Gln Phe Glu Ala Asn Gly Gly Arg Ser Asp Gly Pro Leu Ala Lys
1025                1030                1035                1040
Phe Ser Gly Leu Pro Ala Asn Pro Leu Leu Thr Gln Gln Leu Gln Val
              1045                1050                1055
Pro Glu Asn Trp Leu Val Glu Ala Val Arg Ala Val Tyr Asp Leu Asp
              1060                1065                1070
Asn Ile Lys Leu Thr Asp Ile Gly Gly Pro Val His Ser Glu Phe Asp
              1075                1080                1085
Leu Glu Tyr Leu Leu Leu Glu Gly His Cys Phe Asp Ala Ala Ser Gly
         1090                1095                1100
Ala Pro Pro Arg Gly Leu Gln Leu Val Leu Gly Thr Gln Ser Gln Pro
1105                1110                1115                1120
Thr Leu Val Asp Thr Ile Val Met Ala Asn Leu Gly Tyr Phe Gln Leu
              1125                1130                1135
Lys Ala Asn Pro Gly Ala Trp Ser Leu Arg Leu Arg Glu Gly Lys Ser
         1140                1145                1150
Ala Asp Ile Tyr Ala Ile Ser His Ile Glu Gly Thr Asn Thr His His
         1155                1160                1165
Ser Ala Gly Ser Ser Glu Val Gln Val Leu Ile Thr Ser Leu Arg Ser
         1170                1175                1180
His Val Val Lys Leu Arg Val Ser Lys Lys Pro Gly Met Gln Gln Ala
1185                1190                1195                1200
Glu Leu Leu Ser Asp Asp Asn Glu Gln Ala Ala Gln Ser Gly Met Trp
              1205                1210                1215
Asn Ser Ile Ala Ser Ser Phe Gly Gly Gly Ser Ala Asn Gln Ala Ala
         1220                1225                1230
Ser Asp Glu Asp Thr Glu Thr Ile Asn Ile Phe Ser Val Ala Ser Gly
         1235                1240                1245
His Leu Tyr Glu Arg Leu Leu Arg Ile Met Met Val Ser Leu Leu Lys
         1250                1255                1260
His Thr Lys Ser Pro Val Lys Phe Trp Phe Leu Lys Asn Tyr Leu Ser
1265                1270                1275                1280
Pro Gln Phe Thr Asp Phe Leu Pro His Met Ala Ser Glu Tyr Asn Phe
              1285                1290                1295
Gln Tyr Glu Leu Val Gln Tyr Lys Trp Pro Arg Trp Leu His Gln Gln
         1300                1305                1310
Thr Glu Lys Gln Arg Thr Ile Trp Gly Tyr Lys Ile Leu Phe Leu Asp
         1315                1320                1325
Val Leu Phe Pro Leu Asn Val Arg Lys Ile Ile Phe Val Asp Ala Asp
         1330                1335                1340
Ala Ile Val Arg Thr Asp Ile Lys Glu Leu Tyr Asp Met Asp Leu Gly
1345                1350                1355                1360
```

37

```
Gly Ala Pro Tyr Ala Tyr Thr Pro Phe Cys Asp Ser Arg Lys Glu Met
            1365                1370                1375
Glu Gly Phe Arg Phe Trp Lys Gln Gly Tyr Trp Arg Ser His Leu Met
            1380                1385                1390
Gly Arg Arg Tyr His Ile Ser Ala Leu Tyr Val Val Asp Leu Lys Arg
            1395                1400                1405
Phe Arg Lys Ile Ala Ala Gly Asp Arg Leu Arg Gly Gln Tyr Gln Ala
    1410                1415                1420
Leu Ser Gln Asp Pro Asn Ser Leu Ser Asn Leu Asp Gln Asp Leu Pro
1425                1430                1435                1440
Asn Asn Met Ile His Gln Val Ala Ile Lys Ser Leu Pro Asp Asp Trp
            1445                1450                1455
Leu Trp Cys Gln Thr Trp Cys Ser Asp Ser Asn Phe Lys Thr Ala Lys
            1460                1465                1470
Val Ile Asp Leu Cys Asn Asn Pro Gln Thr Lys Glu Ala Lys Leu Thr
            1475                1480                1485
Ala Ala Gln Arg Ile Val Pro Glu Trp Lys Asp Tyr Asp Ala Glu Leu
    1490                1495                1500
Lys Thr Leu Met Ser Arg Ile Glu Asp His Glu Asn Ser His Ser Arg
1505                1510                1515                1520
Asp Ser Ala Val Asp Asp Ser Val Asp Asp Ser Val Glu Val Thr Thr
            1525            ;       1530                1535
Val Thr Pro Ser His Glu Pro Lys His Gly Glu Leu
            1540                1545


<210> 9
<211> 1447
<212> PRT
<213> S. pombe

<220>
<223> S. pombe UGGT1

<400> 9
Met Arg Trp Gly Phe Trp Phe Ala Ile Ala Thr Leu Ile Thr Ile Cys
 1               5                   10                  15
Tyr Ala Ala Lys Pro Leu Asp Val Lys Ile Ala Ala Thr Phe Asn Ala
            20                  25                  30
Pro Ser Phe Ser Ala Leu Ile Ala Glu Ser Leu Tyr Gln Glu Lys Lys
            35                  40                  45
Glu Gly Phe Ile Trp Tyr Leu Asn His Leu Ser Asp Leu Leu Asp Ala
    50                  55                  60
Glu Asn Thr Thr Glu Lys Glu Leu Tyr Ile Asn Val Val Asn Ser Leu
65                  70                  75                  80
Lys Arg Glu Tyr Val Leu Ser Asp Glu Glu Leu Ser Ser Leu Gln Phe
            85                  90                  95
Ser Leu Gly Leu Phe Ser Gly Ala Pro Lys Leu Gln Ala Phe Ser Ser
            100                 105                 110
Ile Val Gln Ser Arg Thr Cys Asp Cys Asp Thr Trp Leu Gln Leu Asp
            115                 120                 125
Glu Glu Ser Gln Val Cys Phe Ser Asp Leu Pro Lys Asp Ser Pro Leu
    130                 135                 140
Phe Ser Lys Leu Tyr Ser Lys Asn Pro Leu Asp Tyr Glu Val Val Lys
145                 150                 155                 160
Thr Ser Ala Thr Gly Ile Pro Tyr Ala Val Val Val Thr Ser Phe Glu
            165                 170                 175
```

38

```
Arg Asp Leu Ile Pro Phe His Glu Leu Tyr Tyr Lys Leu Ala Leu Glu
            180                     185                 190
Gly Lys Cys Asn Tyr Val Ile Arg Tyr Ser Pro Pro Ser Ser Ser Lys
            195                     200             205
Leu Asn Ser Lys Leu Tyr Val Lys Gly Phe Gly Thr His Val Ser Leu
            210                 215             220
Lys Arg Thr Asp Tyr Leu Val Val Asp Asp Arg Glu Phe Pro Arg Glu
225                     230                 235                 240
Lys Gly Asp Asn Pro Ala Ser Phe Thr Ser Ser Arg Asn Lys Arg Ser
                245                 250                 255
Asn Glu Arg Leu Phe Gly Met Thr Ser Asp Ser Leu Gln Thr Val Thr
            260                     265                 270
Pro Asp Lys Ile Ala Ile Leu Asp Leu Leu Ala Thr Gln Ser Ile Ala
            275                 280                 285
Ser Ser Ala Asp Met Leu Ser Ala Phe Arg Glu Leu Thr Gln Asp Phe
            290                 295                 300
Pro Ile Tyr Ala His Tyr Leu Ser Ile Gln Pro Asp Val Ser Asn His
305                     310                 315                 320
Leu Ile Glu Glu Leu Asn Gln Phe Gln Ser Gln Tyr Val Pro Glu Gly
                325                     330                 335
Ile Asn Thr Ile Trp Leu Asn Gly Leu Ser Leu Asp Leu Glu Glu Thr
            340                     345                 350
Asp Ala Phe Ser Ile Leu Ser Leu Ile Lys Lys Glu Lys Asp Met Phe
            355                 360                 365
Asp Arg Phe Glu Ala Leu Gly Ile Lys Ser Ser Lys Val Leu Asp Ile
            370                 375                 380
Val Thr Asn Glu Ala Phe Ala Asn Glu Asp Ser Asp Phe Lys Phe Val
385                     390                 395                 400
Lys Phe His Cys Gln Asp Asp Ile Glu Asp Trp Lys Ala Ile His Trp
                405                 410                 415
Val Asn Glu Ile Glu Ser Asn Pro Lys Tyr Asp Asn Trp Pro Lys Ser
            420                 425                 430
Ile Gln Ile Leu Leu Lys Pro Ile Tyr Pro Gly Gln Leu His Met Leu
            435                 440                 445
Gly Lys Gln Leu His Thr Val Ile Tyr Pro Ile Phe Pro Ser Ser Pro
    450                 455                 460
Ser Ser Leu Pro Leu Leu Ser Glu Leu Ile Gln Phe Ser Arg Arg Pro
465                 470                 475                 480
Ser Pro Val Gln Thr Gly Met Val Cys Ala Ala Asn Asp Asp Asp Glu
            485                 490                 495
Phe Ala Gln Thr Val Cys Lys Ser Phe Phe Tyr Ile Ser Lys Glu Ser
            500                 505             510
Gly Thr Asp Ser Ala Leu Lys Phe Leu Tyr Lys Cys Leu Asn Ser Asp
            515                 520             525
Ser Ser Ala Asp Leu Tyr Ser Leu Leu Glu Glu His Leu Pro Leu Ser
            530                 535             540
Glu His Asp Asp Asp Thr Leu Ala Asn Leu Lys Lys Asp Leu Ser Ser
545                 550                 555                 560
Ser Phe Phe Asp His Tyr Met Ser Lys Ser Asn Ser Trp Val Asn Arg
                565                 570                 575
Leu Gly Ile Asp Ser Ser Ala Ser Glu Val Ile Val Asn Gly Arg Ile
            580                 585                 590
Ile Ser His Asp Glu Asn Tyr Asp Arg Ser Met Tyr Gly Ile Phe Leu
            595                 600                 605
Glu Asp Ile Pro Glu Val Gln Ile Ala Val Ala Glu Gly Lys Ile Ser
            610                 615                 620
Glu Asp Asp Asn Leu Leu Asp Phe Ile Leu Arg Asp Ala Ser Leu Thr
```

39

```
625                     630                    635                     640
Arg Asn Pro Leu Val Tyr Pro Ser Ala Lys Ser Ser Ile Lys Ser Ile
                    645                    650                    655
Asp Ile Lys Arg Val Leu Glu Asn Val Gly Ser Leu Asn His Glu Asp
                660                    665                    670
Ile Leu Leu Ile Gly Ser Ser Asn Ala Lys Tyr Ser Phe Trp Leu Val
                675                    680                    685
Ala Asp Phe Asn Glu Lys Glu Gly Leu Glu Ile Leu Ser Leu Leu Ala
            690                    695                    700
Asp Leu Leu Ser Glu Asn Lys Asp Ala Asn Leu Met Leu Ile Gln Glu
705                    710                    715                    720
Gly Lys Asn His Val Val Pro Pro Leu Phe Ala Lys Leu Leu Ser Ser
                    725                    730                    735
Pro Lys Arg Ser Ser Lys His Leu Gln Glu Ile Leu Asn Ser Ser Leu
                740                    745                    750
Asp Pro Ser Ser Gly Val Val Asn Asp Met Asp Lys Ala Leu Lys Phe
                755                    760                    765
Leu Lys Lys Ser Lys Ala Val Val Lys Glu Leu Gly Leu Thr Gly Glu
            770                    775                    780
Cys Lys Ser Ala Leu Leu Leu Asn Gly Arg Met Ile Cys Ser Phe Ser
785                    790                    795                    800
Val Asp Ser Leu Asn Thr Ala Asp Leu Lys Met Leu Met Gln Met Glu
                    805                    810                    815
Tyr Asp Asn Tyr Leu Ser Lys Leu Ser Asn Ile Ala Gly Ser Ser Arg
                820                    825                    830
Arg Leu Lys Asn Ser Arg Ala Ile Ser Phe Leu Ser Ser Tyr Leu Lys
            835                    840                    845
Thr Leu Glu Ser Thr Pro Met Ser Thr Ser Ser Pro Thr Lys Glu Glu
            850                    855                    860
Lys Leu Phe Pro Arg Asp Phe Ile Tyr Asn Lys Leu Gly Val Gly Asn
865                    870                    875                    880
Ala Thr Phe Glu Thr Asp Asp Phe Ser Lys Ala Tyr Tyr Gln Phe Val
                    885                    890                    895
Ala Val Leu Asp Pro Leu Ser Lys Asp Ser Gln Lys Trp Ser Ala Ile
            900                    905                    910
Leu Glu Ala Val Ser Lys Leu Asn Gly Val Gly Val Arg Ile His Leu
            915                    920                    925
Asn Pro Lys Gln Thr Leu Ser Glu Leu Pro Leu Thr Arg Phe Tyr Arg
            930                    935                    940
Tyr Ser Ile Ser Ala Glu Pro Glu Phe Asp Ala Leu Gly His Leu Glu
945                    950                    955                    960
Glu Ser Tyr Val Glu Phe Asp Asn Leu Pro Ala Asp Thr Leu Leu Thr
                    965                    970                    975
Met Asp Ile Glu Ala Arg Asp Ala Trp Thr Val Met Gln Lys Asp Val
                980                    985                    990
Asp Ile Asp Leu Phe Asn Ile Lys Leu Glu His Thr Ser Glu Ala Glu
            995                    1000                   1005
Ala Leu Asp Ser His Thr Ala Ile Tyr Glu Leu Lys Asn Ile Leu Val
            1010                   1015                   1020
Gln Gly Tyr Ser Gln Glu Glu Phe Arg Lys Ser Pro Pro Arg Gly Met
1025                   1030                   1035                   1040
Gln Leu Lys Leu Gly Asn Leu Thr Asn Ser His Val Thr Asp Thr Ile
                    1045                   1050                   1055
Val Leu Ser Asn Leu Gly Tyr Phe Gln Leu Lys Ala Asn Pro Gly Val
                1060                   1065                   1070
Trp Thr Leu Glu Pro Met Asp Gly Arg Ser Ser Gln Phe Tyr Glu Ile
                1075                   1080                   1085
```

40

Leu Ser Leu Asn Lys Lys Asn Ser Tyr Lys Asp Pro Gln Val Ile Val
    1090   1095   1100
Asp Ser Phe Glu Gly Val Thr Leu Asn Pro Val Met Arg Arg Lys Pro
1105   1110   1115   1120
Gly Phe Glu Ser Ala Asp Ile Met Asp Glu Asp Leu Ser Ser His Lys
                1125   1130   1135
Phe Phe Asp Lys Ile Lys Lys Ser Leu Ser Phe Phe Asn Phe Lys Arg
                1140   1145   1150
Lys Glu Ala Ser Ile Asn Ile Phe Ser Val Ala Ser Gly His Leu Tyr
        1155   1160   1165
Glu Arg Phe Leu Tyr Ile Met Thr Lys Ser Val Ile Glu His Thr Asp
    1170   1175   1180
Lys Lys Val Lys Phe Trp Phe Ile Glu Asn Phe Leu Ser Pro Cys Phe
1185   1190   1195   1200
Lys Ser Ser Ile Pro Ala Ile Ala Lys Lys Tyr Asn Phe Glu Tyr Glu
                1205   1210   1215
Tyr Ile Thr Tyr Asn Trp Pro His Trp Leu Arg Lys Gln Glu Glu Lys
                1220   1225   1230
Gln Arg Glu Ile Trp Gly Tyr Lys Ile Leu Phe Leu Asp Val Leu Phe
        1235   1240   1245
Pro Leu Glu Leu His Lys Val Ile Tyr Val Asp Ala Gln Ile Val Arg
    1250   1255   1260
Ala Asp Leu Gln Glu Leu Met Asp Met Asp Leu His Gly Ala Pro Tyr
1265   1270   1275   1280
Gly Tyr Thr Pro Met Cys Asp Ser Arg Glu Glu Met Glu Gly Phe Arg
                1285   1290   1295
Phe Trp Lys Lys Gly Tyr Trp Lys Lys Phe Leu Arg Gly Leu Lys Tyr
        1300   1305   1310
His Ile Ser Ala Leu Tyr Val Val Asp Leu Asp Arg Phe Arg Lys Met
        1315   1320   1325
Gly Ala Gly Asp Leu Leu Arg Arg Gln Tyr Gln Leu Leu Ser Ala Asp
    1330   1335   1340
Pro Asn Ser Leu Ser Asn Leu Asp Gln Asp Leu Pro Asn His Leu Gln
1345   1350   1355   1360
His Leu Ile Pro Ile Tyr Ser Leu Pro Gln Asp Trp Leu Trp Cys Glu
                1365   1370   1375
Thr Trp Cys Ser Asp Glu Ser Leu Lys Thr Ala Lys Thr Ile Asp Leu
        1380   1385   1390
Cys Gln Asn Pro Leu Thr Lys Glu Lys Lys Leu Asp Arg Ala Arg Arg
        1395   1400   1405
Gln Val Ser Glu Trp Thr Ser Tyr Asp Asn Glu Ile Ala Ser Val Leu
    1410   1415   1420
Gln Thr Ala Ser Ser Gln Ser Asp Lys Glu Phe Glu Glu Lys Asp Asn
1425   1430   1435   1440
Asn Ser Ser Pro Asp Glu Leu
                1445

<210> 10
<211> 859
<212> PRT
<213> S. cerevisiae

<220>
<223> S. cerevisiae Alr1p

<400> 10

41

```
Met Ser Ser Ser Ser Ser Ser Ser Glu Ser Ser Pro Asn Leu Ser Arg
 1             5                  10              15
Ser Asn Ser Leu Ala Asn Thr Met Val Ser Met Lys Thr Glu Asp His
           20              25              30
Thr Gly Leu Tyr Asp His Arg Gln His Pro Asp Ser Leu Pro Val Arg
       35              40              45
His Gln Pro Pro Thr Leu Lys Asn Lys Glu Ile Ala Lys Ser Thr Lys
   50              55              60
Pro Ser Ile Pro Lys Glu Gln Lys Ser Ala Thr Arg Tyr Asn Ser His
65              70              75              80
Val Asp Val Gly Ser Val Pro Ser Arg Gly Arg Met Asp Phe Glu Asp
               85              90              95
Glu Gly Gln Gly Met Asp Glu Thr Val Ala His His Gln Leu Arg Ala
           100             105             110
Ser Ala Ile Leu Thr Ser Asn Ala Arg Pro Ser Arg Leu Ala His Ser
           115             120             125
Met Pro His Gln Arg Gln Leu Tyr Val Glu Ser Asn Ile His Thr Pro
   130             135             140
Pro Lys Asp Val Gly Val Lys Arg Asp Tyr Thr Met Ser Ser Ser Thr
145             150             155             160
Ala Ser Ser Gly Asn Lys Ser Lys Leu Ser Ala Ser Ser Ser Ala Ser
               165             170             175
Pro Ile Thr Lys Val Arg Lys Ser Ser Leu Val Ser Pro Val Leu Glu
           180             185             190
Ile Pro His Glu Ser Lys Ser Asp Thr His Ser Lys Leu Ala Lys Pro
           195             200             205
Lys Lys Arg Thr Tyr Ser Thr Thr Ser Ala His Ser Ser Ile Asn Pro
   210             215             220
Ala Val Leu Leu Thr Lys Ser Thr Ser Gln Lys Ser Asp Ala Asp Asp
225             230             235             240
Asp Thr Leu Glu Arg Lys Pro Val Arg Met Asn Thr Arg Ala Ser Phe
           245             250             255
Asp Ala Asp Val Ser Gln Ala Ser Arg Asp Ser Gln Glu Thr Glu Glu
           260             265             270
Asp Val Cys Phe Pro Met Pro Pro Gln Leu His Thr Arg Val Asn Gly
       275             280             285
Ile Asp Phe Asp Glu Leu Glu Glu Tyr Ala Gln Phe Ala Asn Ala Glu
   290             295             300
Lys Ser Gln Phe Leu Ala Ser Leu Gln Val Pro Asn Glu Gln Lys Tyr
305             310             315             320
Ser Asn Val Ser Gln Asp Ile Gly Phe Thr Ser Ser Thr Ser Thr Ser
           325             330             335
Gly Ser Ser Ala Ala Leu Lys Tyr Thr Pro Arg Val Ser Gln Thr Gly
           340             345             350
Glu Lys Ser Glu Ser Thr Asn Glu Thr Glu Ile His Glu Lys Lys Glu
           355             360             365
Asp Glu His Glu Lys Ile Lys Pro Ser Leu His Pro Gly Ile Ser Phe
   370             375             380
Gly Lys Asn Lys Val Glu Gly Glu Glu Asn Glu Asn Ile Pro Ser Asn
385             390             395             400
Asp Pro Ala Tyr Cys Ser Tyr Gln Gly Thr Asp Phe Gln Ile Pro Asn
           405             410             415
Arg Phe Ser Phe Phe Cys Ser Glu Ser Asp Glu Thr Val His Ala Ser
           420             425             430
Asp Ile Pro Ser Leu Val Ser Glu Gly Gln Thr Phe Tyr Glu Leu Phe
           435             440             445
Arg Gly Gly Glu Pro Thr Trp Trp Leu Asp Cys Ser Cys Pro Thr Asp
```

42

```
            450                     455                     460
Asp Glu Met Arg Cys Ile Ala Lys Ala Phe Gly Ile His Pro Leu Thr
465                     470                     475                     480
Ala Glu Asp Ile Arg Met Gln Glu Thr Arg Glu Lys Val Glu Leu Phe
                    485                     490                     495
Lys Ser Tyr Tyr Phe Val Cys Phe His Thr Phe Glu Asn Asp Lys Glu
                500                     505                     510
Ser Glu Asp Phe Leu Glu Pro Ile Asn Val Tyr Ile Val Val Cys Arg
                515                     520                     525
Ser Gly Val Leu Thr Phe His Phe Gly Pro Ile Ser His Cys Ala Asn
                530                     535                     540
Val Arg Arg Arg Val Arg Gln Leu Arg Asp Tyr Val Asn Val Asn Ser
545                     550                     555                     560
Asp Trp Leu Cys Tyr Ala Leu Ile Asp Asp Ile Thr Asp Ser Phe Ala
                    565                     570                     575
Pro Val Ile Gln Ser Ile Glu Tyr Glu Ala Asp Ala Ile Glu Asp Ser
                580                     585                     590
Val Phe Met Ala Arg Asp Met Asp Phe Ala Ala Met Leu Gln Arg Ile
                595                     600                     605
Gly Glu Ser Arg Arg Lys Thr Met Thr Leu Met Arg Leu Leu Ser Gly
            610                     615                     620
Lys Ala Asp Val Ile Lys Met Phe Ala Lys Arg Cys Gln Asp Glu Ala
625                     630                     635                     640
Asn Gly Ile Gly Pro Ala Leu Thr Ser Gln Ile Asn Ile Ala Asn Leu
                    645                     650                     655
Gln Ala Arg Gln Asp Asn Ala Ser His Ile Lys Asn Asn Ser Ser Thr
                660                     665                     670
Thr Val Pro Asn Asn Tyr Ala Pro Thr Thr Ser Gln Pro Arg Gly Asp
                675                     680                     685
Ile Ala Leu Tyr Leu Gly Asp Ile Gln Asp His Leu Leu Thr Met Phe
                690                     695                     700
Gln Asn Leu Leu Ala Tyr Glu Lys Ile Phe Ser Arg Ser His Thr Asn
705                     710                     715                     720
Tyr Leu Ala Gln Leu Gln Val Glu Ser Phe Asn Ser Asn Asn Lys Val
                    725                     730                     735
Thr Glu Met Leu Gly Lys Val Thr Met Ile Gly Thr Met Leu Val Pro
                740                     745                     750
Leu Asn Val Ile Thr Gly Leu Phe Gly Met Asn Val Lys Val Pro Gly
                    755                     760                     765
Glu Asn Ser Ser Ile Ala Trp Trp Phe Gly Ile Leu Gly Val Leu Leu
                770                     775                     780
Leu Leu Ala Val Leu Gly Trp Phe Leu Ala Ser Tyr Trp Ile Lys Arg
785                     790                     795                     800
Ile Asp Pro Pro Ala Thr Leu Asn Glu Ala Ala Glu Ser Gly Ala Lys
                    805                     810                     815
Ser Val Ile Ser Ser Phe Leu Pro Lys Arg Asn Lys Arg Phe Asn Asp
                820                     825                     830
Arg Ser Lys Asn Ile Asn Val Arg Ala Gly Pro Ser Asn Lys Ser Val
            835                     840                     845
Ala Ser Leu Pro Ser Arg Tyr Ser Arg Tyr Asp
            850                     855


<210> 11
<211> 858
<212> PRT
<213> S. cerevisiae
```

43

<220>
<223> S. cerevisiae Alr2p

<400> 11
Met Ser Ser Leu Ser Thr Ser Phe Asp Ser Ser Ser Asp Leu Pro Arg
1   5   10   15
Ser Lys Ser Val Asp Asn Thr Ala Ala Ser Met Lys Thr Gly Lys Tyr
            20   25   30
Pro Lys Leu Glu Asn Tyr Arg Gln Tyr Ser Asp Ala Gln Pro Ile Arg
        35   40   45
His Glu Ala Leu Ala Leu Lys Val Asp Glu Thr Lys Asp Ser Arg His
    50   55   60
Lys Phe Ser Ser Ser Asn Gly Glu Asn Ser Gly Val Glu Asn Gly Gly
65   70   75   80
Tyr Val Glu Lys Thr Asn Ile Ser Thr Ser Gly Arg Met Asp Phe Glu
                85   90   95
Gly Glu Ala Glu Ala Glu Ala Val Lys Arg Tyr Gln Leu Arg Ser Phe
            100   105   110
Ala Leu Leu Ser Ser Asn Ala Arg Pro Ser Arg Leu Ala Lys Ser Glu
        115   120   125
Thr His Gln Lys Gln Ile His Val Glu Ser Ile Ala Pro Ser Leu Pro
    130   135   140
Lys Asn Ala Ala Leu Glu Arg Gly His Asp Thr Ala Leu Pro Ala Gly
145   150   155   160
Thr Ser Ser Asn Arg Cys Asn Leu Glu Ala Ser Ser Ser Ala Arg Thr
                165   170   175
Phe Thr Ser Ala Arg Lys Ala Ser Leu Val Ser Ala Ile Phe Glu Thr
            180   185   190
Ser Ala Glu Ser Glu His Gly Thr His Pro Lys Gln Ala Lys Leu Lys
            195   200   205
Arg Arg Thr Tyr Ser Thr Ile Ser Thr His Ser Ser Val Asn Pro Thr
    210   215   220
Thr Leu Leu Thr Arg Thr Ala Ser Gln Lys Ser Asp Met Gly Asn Asp
225   230   235   240
Thr Arg Arg Ile Lys Pro Leu Arg Met Asp Ser Arg Val Ser Phe His
            245   250   255
Ser Glu Ile Ser Gln Ala Ser Arg Asp Ser Gln Glu Thr Glu Glu Asp
            260   265   270
Val Cys Phe Pro Met Phe Arg Leu Leu His Thr Arg Val Asn Gly Val
    275   280   285
Asp Phe Asp Glu Leu Glu Glu Tyr Ala Gln Ile Ser Asn Ala Glu Arg
    290   295   300
Asn Leu Ser Leu Ala Asn His Gln Arg His Ser Glu Arg Thr Tyr Asn
305   310   315   320
His Thr Asp Gln Asp Thr Gly Phe Thr Asn Ser Ala Ser Thr Ser Gly
            325   330   335
Ser Ser Ala Ala Leu Lys Tyr Thr Pro Glu Ile Ser Arg Thr Leu Glu
            340   345   350
Lys Asn Cys Ser Val Asn Glu Met Tyr Val Ser Glu Asn Asn Glu Ser
            355   360   365
Val Arg Glu Asp Asp Lys Pro Asp Leu His Pro Asp Val Thr Phe Gly
    370   375   380
Arg Asn Lys Ile Glu Gly Glu Lys Glu Gly Asn Asp Ser Ser Tyr Ser
385   390   395   400
Arg Ala Tyr Tyr Thr Leu Gln Asn Thr Glu Tyr Gln Ile Pro Ser Arg
                405   410   415

44

```
Phe Ser Phe Phe Arg Ser Glu Ser Asp Glu Thr Val His Ala Ser Asp
              420                 425                 430
Ile Pro Ser Leu Ile Ser Glu Gly Gln Thr Phe Tyr Glu Leu Phe Lys
              435                 440                 445
Gly Gly Asp Pro Thr Trp Trp Leu Asp Cys Ser Cys Pro Thr Asp Asp
    450                 455                 460
Glu Met Arg Cys Ile Ala Lys Thr Phe Gly Ile His Pro Leu Thr Ala
465                 470                 475                 480
Glu Asp Ile Arg Met Gln Glu Thr Arg Glu Lys Val Glu Leu Phe Lys
              485                 490                 495
Ser Tyr Tyr Phe Val Cys Phe His Thr Phe Glu Asn Asp Lys Glu Ser
              500                 505                 510
Glu Asn Tyr Leu Glu Pro Ile Asn Val Tyr Ile Val Val Phe Arg Ser
              515                 520                 525
Gly Val Leu Thr Phe His Phe Asp Pro Ile Ser His Cys Ala Asn Val
    530                 535                 540
Arg Arg Arg Val Arg Gln Leu Arg Asp Tyr Val Ser Val Asn Ser Asp
545                 550                 555                 560
Trp Leu Cys Tyr Ala Leu Ile Asp Asp Ile Thr Asp Ser Phe Ala Pro
              565                 570                 575
Val Ile Gln Ser Ile Glu Tyr Glu Ala Asp Ser Ile Asp Asp Ser Val
              580                 585                 590
Phe Met Thr Arg Asp Met Asp Phe Ala Ala Met Leu Gln Arg Ile Gly
              595                 600                 605
Glu Ser Arg Arg Lys Thr Met Thr Leu Met Arg Leu Leu Ser Gly Lys
    610                 615                 620
Ala Asp Val Ile Lys Met Phe Ala Lys Arg Cys Gln Asp Glu Thr Asn
625                 630                 635                 640
Gly Ile Gly Pro Val Leu Lys Ser Gln Thr Asn Met Val Asn Leu Gln
              645                 650                 655
Ala Glu Gln Glu Asn Val Asn Gln Asn Asn Ser Asn Asn Gln Ile Ser
              660                 665                 670
Leu Ser Asn Ser Tyr Met Gln Thr Thr Ser Gln Pro Arg Gly Asp Ile
    675                 680                 685
Ala Leu Tyr Leu Gly Asp Ile Gln Asp His Leu Leu Thr Met Phe Gln
    690                 695                 700
Asn Leu Leu Ala Tyr Glu Lys Ile Phe Ser Arg Ser His Ala Asn Tyr
705                 710                 715                 720
Leu Ala Gln Leu Gln Val Glu Ser Phe Asn Ser Asn Asn Lys Val Thr
              725                 730                 735
Glu Met Leu Gly Lys Val Thr Met Leu Gly Thr Met Leu Val Pro Leu
              740                 745                 750
Asn Val Ile Thr Gly Leu Phe Gly Met Asn Val Lys Val Pro Gly Arg
              755                 760                 765
Asn Gly Ser Ile Ala Trp Trp Tyr Gly Ile Leu Gly Val Leu Leu Leu
    770                 775                 780
Leu Ala Val Ile Ser Trp Phe Leu Ala Ser Tyr Trp Ile Lys Lys Ile
785                 790                 795                 800
Asp Pro Pro Ala Thr Leu Asn Glu Ala Ala Gly Ser Gly Ala Lys Ser
              805                 810                 815
Val Ile Ser Ser Phe Leu Pro Lys Arg Asp Lys Arg Phe Asn Asp Asp
              820                 825                 830
Ser Lys Asn Gly Asn Ala Arg Val Gly Val Arg Arg Lys Ser Thr Val
              835                 840                 845
Ser Leu Pro Ser Arg Tyr Ser Arg Tyr Asn
    850                 855
```

<210> 12
<211> 854
<212> PRT
<213> S. cerevisiae

<220>
<223> S. cerevisiae CDC24

<400> 12
Met Ala Ile Gln Thr Arg Phe Ala Ser Gly Thr Ser Leu Ser Asp Leu
 1   5   10   15
Lys Pro Lys Pro Ser Ala Thr Ser Ile Ser Ile Pro Met Gln Asn Val
            20   25   30
Met Asn Lys Pro Val Thr Glu Gln Asp Ser Leu Phe His Ile Cys Ala
        35   40   45
Asn Ile Arg Lys Arg Leu Glu Val Leu Pro Gln Leu Lys Pro Phe Leu
    50   55   60
Gln Leu Ala Tyr Gln Ser Ser Glu Val Leu Ser Glu Arg Gln Ser Leu
65   70   75   80
Leu Leu Ser Gln Lys Gln His Gln Glu Leu Leu Lys Ser Asn Gly Ala
                85   90   95
Asn Arg Asp Ser Ser Asp Leu Ala Pro Thr Leu Arg Ser Ser Ser Ile
            100   105   110
Ser Thr Ala Thr Ser Leu Met Ser Met Glu Gly Ile Ser Tyr Thr Asn
        115   120   125
Ser Asn Pro Ser Ala Thr Pro Asn Met Glu Asp Thr Leu Leu Thr Phe
    130   135   140
Ser Met Gly Ile Leu Pro Ile Thr Met Asp Cys Asp Pro Val Thr Gln
145   150   155   160
Leu Ser Gln Leu Phe Gln Gln Gly Ala Pro Leu Cys Ile Leu Phe Asn
                165   170   175
Ser Val Lys Pro Gln Phe Lys Leu Pro Val Ile Ala Ser Asp Asp Leu
            180   185   190
Lys Val Cys Lys Lys Ser Ile Tyr Asp Phe Ile Leu Gly Cys Lys Lys
            195   200   205
His Phe Ala Phe Asn Asp Glu Glu Leu Phe Thr Ile Ser Asp Val Phe
    210   215   220
Ala Asn Ser Thr Ser Gln Leu Val Lys Val Leu Glu Val Val Glu Thr
225   230   235   240
Leu Met Asn Ser Ser Pro Thr Ile Phe Pro Ser Lys Ser Lys Thr Gln
                245   250   255
Gln Ile Met Asn Ala Glu Asn Gln His Arg His Gln Pro Gln Gln Ser
            260   265   270
Ser Lys Lys His Asn Glu Tyr Val Lys Ile Ile Lys Glu Phe Val Ala
        275   280   285
Thr Glu Arg Lys Tyr Val His Asp Leu Glu Ile Leu Asp Lys Tyr Arg
    290   295   300
Gln Gln Leu Leu Asp Ser Asn Leu Ile Thr Ser Glu Glu Leu Tyr Met
305   310   315   320
Leu Phe Pro Asn Leu Gly Asp Ala Ile Asp Phe Gln Arg Arg Phe Leu

                325   330   335
Ile Ser Leu Glu Ile Asn Ala Leu Val Glu Pro Ser Lys Gln Arg Ile
        340   345   350
Gly Ala Leu Phe Met His Ser Lys His Phe Phe Lys Leu Tyr Glu Pro
        355   360   365

46

```
Trp Ser Ile Gly Gln Asn Ala Ala Ile Glu Phe Leu Ser Ser Thr Leu
    370                 375                 380
His Lys Met Arg Val Asp Glu Ser Gln Arg Phe Ile Ile Asn Asn Lys
385                 390                 395                 400
Leu Glu Leu Gln Ser Phe Leu Tyr Lys Pro Val Gln Arg Leu Cys Arg
                405                 410                 415
Tyr Pro Leu Leu Val Lys Glu Leu Leu Ala Glu Ser Ser Asp Asp Asn
                420                 425                 430
Asn Thr Lys Glu Leu Glu Ala Ala Leu Asp Ile Ser Lys Asn Ile Ala
        435                 440                 445
Arg Ser Ile Asn Glu Asn Gln Arg Arg Thr Glu Asn His Gln Val Val
        450                 455                 460
Lys Lys Leu Tyr Gly Arg Val Val Asn Trp Lys Gly Tyr Arg Ile Ser
465                 470                 475                 480
Lys Phe Gly Glu Leu Leu Tyr Phe Asp Lys Val Phe Ile Ser Thr Thr
                485                 490                 495
Asn Ser Ser Ser Glu Pro Glu Arg Glu Phe Glu Val Tyr Leu Phe Glu
                500                 505                 510
Lys Ile Ile Ile Leu Phe Ser Glu Val Val Thr Lys Lys Ser Ala Ser
        515                 520                 525
Ser Leu Ile Leu Lys Lys Lys Ser Ser Thr Ser Ala Ser Ile Ser Ala
    530                 535                 540
Ser Asn Ile Thr Asp Asn Asn Gly Ser Pro His His Ser Tyr His Lys
545                 550                 555                 560
Arg His Ser Asn Ser Ser Ser Ser Asn Asn Ile His Leu Ser Ser Ser
                565                 570                 575
Ser Ala Ala Ala Ile Ile His Ser Ser Thr Asn Ser Ser Asp Asn Asn
        580                 585                 590
Ser Asn Asn Ser Ser Ser Ser Ser Leu Phe Lys Leu Ser Ala Asn Glu
        595                 600                 605
Pro Lys Leu Asp Leu Arg Gly Arg Ile Met Ile Met Asn Leu Asn Gln
    610                 615                 620
Ile Ile Pro Gln Asn Asn Arg Ser Leu Asn Ile Thr Trp Glu Ser Ile
625                 630                 635                 640
Lys Glu Gln Gly Asn Phe Leu Leu Lys Phe Lys Asn Glu Glu Thr Arg
                645                 650                 655
Asp Asn Trp Ser Ser Cys Leu Gln Gln Leu Ile His Asp Leu Lys Asn
                660                 665                 670
Glu Gln Phe Lys Ala Arg His His Ser Ser Thr Ser Thr Thr Ser Ser
        675                 680                 685
Thr Ala Lys Ser Ser Ser Met Met Ser Pro Thr Thr Thr Met Asn Thr
    690                 695                 700
Pro Asn His His Asn Ser Arg Gln Thr His Asp Ser Met Ala Ser Phe
705                 710                 715                 720
Ser Ser Ser His Met Lys Arg Val Ser Asp Val Leu Pro Lys Arg Arg
                725                 730                 735
Thr Thr Ser Ser Ser Phe Glu Ser Glu Ile Lys Ser Ile Ser Glu Asn
                740                 745                 750
Phe Lys Asn Ser Ile Pro Glu Ser Ser Ile Leu Phe Arg Ile Ser Tyr
        755                 760                 765
Asn Asn Asn Ser Asn Asn Thr Ser Ser Ser Glu Ile Phe Thr Leu Leu
        770                 775                 780
Val Glu Lys Val Trp Asn Phe Asp Asp Leu Ile Met Ala Ile Asn Ser
785                 790                 795                 800
Lys Ile Ser Asn Thr His Asn Asn Asn Ile Ser Pro Ile Thr Lys Ile
        805                 810                 815
Lys Tyr Gln Asp Glu Asp Gly Asp Phe Val Val Leu Gly Ser Asp Glu
```

47

```
                 820                         825                         830
Asp Trp Asn Val Ala Lys Glu Met Leu Ala Glu Asn Asn Glu Lys Phe
         835                         840                         845
Leu Asn Ile Arg Leu Tyr
    850


<210> 13
<211> 834
<212> PRT
<213> S. pombe

<220>
<223> S. pombe CDC24

<400> 13
Met Lys Leu Arg Leu Leu Gln Ser Pro Ser Gln Val Ile Tyr Asn Leu
 1               5                   10                  15
Glu Asn Thr Val Ser Leu Tyr Arg Arg Cys Leu Asn Leu Arg Lys Arg
            20                  25                  30
Leu Met Asp Ile Ser Glu Leu Ala Ala Phe Phe Asp Ser Ile His Arg
        35                  40                  45
Glu Ala Leu Asn Ser Ser Phe Lys Ile Leu Glu Phe Lys Asp Ile Glu
    50                  55                  60
Phe Asp Asp Pro Val Thr Glu Ile Trp Leu Phe Cys Arg Leu Gly Tyr
65                  70                  75                  80
Pro Leu Cys Ala Leu Phe Asn Cys Leu Pro Val Lys Gln Lys Leu Glu
                85                  90                  95
Val Asn Ser Ser Val Ser Leu Glu Asn Thr Asn Val Cys Lys Ala Ser
            100                 105                 110
Leu Tyr Arg Phe Met Leu Met Cys Lys Asn Glu Leu Gly Leu Thr Asp
        115                 120                 125
Ala Ala Leu Phe Ser Ile Ser Glu Ile Tyr Lys Pro Ser Thr Ala Pro
    130                 135                 140
Leu Val Arg Ala Leu Gln Thr Ile Glu Leu Leu Leu Lys Lys Tyr Glu
145                 150                 155                 160
Val Ser Asn Thr Thr Lys Ser Ser Ser Thr Pro Ser Pro Ser Thr Asp
                165                 170                 175
Asp Asn Val Pro Thr Gly Thr Leu Asn Ser Leu Ile Ala Ser Gly Arg
            180                 185                 190
Arg Val Thr Ala Glu Leu Tyr Glu Thr Glu Leu Lys Tyr Ile Gln Asp
        195                 200                 205
Leu Glu Tyr Leu Ser Asn Tyr Met Val Ile Leu Gln Gln Lys Gln Ile
    210                 215                 220
Leu Ser Gln Asp Thr Ile Leu Ser Ile Phe Thr Asn Leu Asn Glu Ile
225                 230                 235                 240
Leu Asp Phe Gln Arg Arg Phe Leu Val Gly Leu Glu Met Asn Leu Ser
                245                 250                 255
Leu Pro Val Glu Glu Gln Arg Leu Gly Ala Leu Phe Ile Ala Leu Glu
            260                 265                 270
Glu Gly Phe Ser Val Tyr Gln Val Phe Cys Thr Asn Phe Pro Asn Ala
        275                 280                 285
Gln Gln Leu Ile Ile Asp Asn Gln Asn Gln Leu Leu Lys Val Ala Asn
    290                 295                 300
Leu Leu Glu Pro Ser Tyr Glu Leu Pro Ala Leu Leu Ile Lys Pro Ile
305                 310                 315                 320
Gln Arg Ile Cys Lys Tyr Pro Leu Leu Leu Asn Gln Leu Leu Lys Gly
```

                                      48

```
                     325                           330                           335
Thr Pro Ser Gly Tyr Gln Tyr Glu Glu Glu Leu Lys Gln Gly Met Ala
             340                           345                 350
Cys Val Val Arg Val Ala Asn Gln Val Asn Glu Thr Arg Arg Ile His
             355                 360                 365
Glu Asn Arg Asn Ala Ile Ile Glu Leu Glu Gln Arg Val Ile Asp Trp
         370                 375                 380
Lys Gly Tyr Ser Leu Gln Tyr Phe Gly Gln Leu Leu Val Trp Asp Val
385                     390                 395                     400
Val Asn Val Cys Lys Ala Asp Ile Glu Arg Glu Tyr His Val Tyr Leu
                 405                 410                 415
Phe Glu Lys Ile Leu Leu Cys Cys Lys Glu Met Ser Thr Leu Lys Arg
             420                 425                 430
Gln Ala Arg Ser Ile Ser Met Asn Lys Lys Thr Lys Arg Leu Asp Ser
             435                 440                 445
Leu Gln Leu Lys Gly Arg Ile Leu Thr Ser Asn Ile Thr Thr Val Val
         450                 455                 460
Pro Asn His His Met Gly Ser Tyr Ala Ile Gln Ile Phe Trp Arg Gly
465                 470                 475                     480
Asp Pro Gln His Glu Ser Phe Ile Leu Lys Leu Arg Asn Glu Glu Ser
                 485                 490                 495
His Lys Leu Trp Met Ser Val Leu Asn Arg Leu Leu Trp Lys Asn Glu
             500                 505                 510
His Gly Ser Pro Lys Asp Ile Arg Ser Ala Ala Ser Thr Pro Ala Asn
         515                 520                 525
Pro Val Tyr Asn Arg Ser Ser Ser Gln Thr Ser Lys Gly Tyr Asn Ser
         530                 535                 540
Ser Asp Tyr Asp Leu Leu Arg Thr His Ser Leu Asp Glu Asn Val Asn
545                 550                 555                     560
Ser Pro Thr Ser Ile Ser Ser Pro Ser Ser Lys Ser Ser Pro Phe Thr
                 565                 570                 575
Lys Thr Thr Ser Lys Asp Thr Lys Ser Ala Thr Thr Thr Asp Glu Arg
             580                 585                 590
Pro Ser Asp Phe Ile Arg Leu Asn Ser Glu Glu Ser Val Gly Thr Ser
         595                 600                 605
Ser Leu Arg Thr Ser Gln Thr Thr Ser Thr Ile Val Ser Asn Asp Ser
         610                 615                 620
Ser Ser Thr Ala Ser Ile Pro Ser Gln Ile Ser Arg Ile Ser Gln Val
625                 630                 635                     640
Asn Ser Leu Leu Asn Asp Tyr Asn Tyr Asn Arg Gln Ser His Ile Thr
             645                 650                 655
Arg Val Tyr Ser Gly Thr Asp Asp Gly Ser Ser Val Ser Ile Phe Glu
             660                 665                 670
Asp Thr Ser Ser Ser Thr Lys Gln Lys Ile Phe Asp Gln Pro Thr Thr
         675                 680                 685
Asn Asp Cys Asp Val Met Arg Pro Arg Gln Tyr Ser Tyr Ser Ala Gly
         690                 695                 700
Met Lys Ser Asp Gly Ser Leu Leu Pro Ser Thr Lys His Thr Ser Leu
705                 710                 715                     720
Ser Ser Ser Ser Thr Ser Thr Ser Leu Ser Val Arg Asn Thr Thr Asn
             725                 730                 735
Val Lys Ile Arg Leu Arg Leu His Glu Val Ser Leu Val Leu Val Val
             740                 745                 750
Ala His Asp Ile Thr Phe Asp Glu Leu Leu Ala Lys Val Glu His Lys
         755                 760                 765
Ile Lys Leu Cys Gly Ile Leu Lys Gln Ala Val Pro Phe Arg Val Arg
         770                 775                 780
```

```
Leu Lys Tyr Val Asp Glu Asp Gly Asp Phe Ile Thr Ile Thr Ser Asp
785                 790             795                 800
Glu Asp Val Leu Met Ala Phe Glu Thr Cys Thr Phe Glu Leu Met Asp
                805             810             815
Pro Val His Asn Lys Gly Met Asp Thr Val Ser Leu His Val Val Val
            820             825             830
Tyr Phe
```